

*The University Library
Leeds*




*Medical and Dental
Library*

CAGE

TYR

102



Digitized by the Internet Archive
in 2015

A
PRACTICAL WORK
ON
THE EYE.

PRAGMATICAL WORK

THE END

A
PRACTICAL WORK
ON THE
DISEASES OF THE EYE,
AND THEIR
TREATMENT,
MEDICALLY, TOPICALLY,
AND BY
OPERATION.

BY
FREDERICK TYRRELL,

SENIOR SURGEON TO THE ROYAL LONDON OPHTHALMIC HOSPITAL;
SURGEON TO ST. THOMAS'S HOSPITAL;
PROFESSOR OF ANATOMY AND SURGERY AT THE ROYAL COLLEGE OF SURGEONS
IN LONDON, ETC.

VOL. II.



LONDON:
JOHN CHURCHILL, PRINCES STREET, SOHO.

MDCCCXL.

UNIVERSITY OF LEEDS
MEDICAL LIBRARY.

602901

METCALFE, PRINTER,
GROCCERS' HALL COURT, POULTRY,
LONDON.

CONTENTS OF VOL. II.

	PAGE
Of AMAUROSIS - - - - -	1
Functional diseases - - - - -	3
Organic diseases - - - - -	„
Diseases which affect the retina itself -	4
orbital portion of the	
optic nerve - -	5
cerebral portion -	„
entire apparatus of vision	„
ANATOMY of the CHOROID - - - - -	6
<i>Pigment</i> - - - - -	9
Of the CILIARY BODY and PROCESSES - - -	11
MORBID CONDITIONS of the CHOROID - - -	13
PARTIAL TEMPORARY DISTENSION of the vessels of -	15
<i>Muscæ</i> - - - - -	18
Treatment - - - - -	21
VARICOSITY of some of the vessels of the CHOROID	23
Treatment - - - - -	24
TEMPORARY CONGESTION of the CHOROID - -	25
Treatment - - - - -	28
INFLAMMATION of the CHOROID - - - - -	32
<i>Chronic inflammation of</i> - - - - -	„
<i>Staphyloma scleroticæ</i> - - - - -	35
<i>Acute choroiditis</i> - - - - -	37
Case 63 - - - - -	40

	PAGE
Treatment - - - - -	47
Cases 64, 65, 66, 67, 68, 69, and 70 -	53—79
HYDROPHTHALMIA - - - - -	82
Treatment - - - - -	83
Case 71 - - - - -	84
<i>Deficiency of pigment</i> - - - - -	89
ANATOMY of the RETINA - - - - -	91
Use of the retina - - - - -	94
ANATOMY of the VITREOUS BODY - - - - -	95
<i>Hyaloid membrane</i> - - - - -	96
Specific gravity of vitreous fluid - - - - -	„
Chemical analysis of - - - - -	„
Refractive power of - - - - -	„
Use of the vitreous body - - - - -	97
Of the MORBID CONDITIONS of the RETINA - - - - -	98
<i>Diminution or loss of vision from affection of retina only</i> - - - - -	99
Want of exercise - - - - -	100
Excess of light - - - - -	101
Case 72 - - - - -	„
Lightning - - - - -	„
Reflected light - - - - -	102
Effect on retina morbidly sensible - - - - -	„
Concussion - - - - -	„
Cases 73 and 74 - - - - -	103
Blows on the eyebrow - - - - -	104
Narcotics - - - - -	„
Effect of belladonna - - - - -	„
Treatment - - - - -	105
If from want of exercise - - - - -	„
Cases 75 and 76 - - - - -	107—109
If from too brilliant light - - - - -	„
If from concussion - - - - -	110
Remote effects of concussion - - - - -	111
If from narcotics - - - - -	„

	PAGE
Of CONGESTION of the RETINA - - -	112
Treatment - - -	113
Of INFLAMMATION of the RETINA - - -	„
Treatment - - -	114
Cases 77, 78, 79, and 80 - -	115—122
INFLAMMATION of the RETINA extending to the vitreous body and lens - - -	127
Divisions - - -	„
<i>Chronic retinitis and glaucoma</i> - - -	128
<i>Visus diffiguratus</i> - - -	130
Cases 81 and 82 - - -	137—138
Treatment - - -	141
<i>Acute retinitis or glaucoma</i> - - -	146
Treatment - - -	151
Cases 83, 84, and 85 - - -	153—156
SCROFULOUS and MALIGNANT DISEASE of RETINA or optic nerve - - -	161
Treatment - - -	165
Case 86 - - -	„
Cases 87, 88, and 89 - - -	172—182
CAT'S EYE AMAUROSIS - - -	188
Case 90 - - -	190
INFLAMMATION of the GLOBE - - -	193
Treatment - - -	194
LESIONS of the RETINA - - -	195
Case 91 - - -	„
ORBITAR PORTION of the OPTIC NERVE - - -	199
DISEASES of the ORBIT - - -	201
<i>Simple inflammation of the cellular tissue of the orbit</i> - - -	202
Treatment - - -	203
<i>Phlegmonous inflammation of the cellular tissue of the orbit</i> - - -	205
Treatment - - -	206
Case 92 - - -	207

	PAGE
<i>Scrofulous or scrofulo-syphilitic disease of orbit</i> -	209
Treatment - - - - -	210
TUMORS of the ORBIT - - - - -	211
Treatment - - - - -	213
Cases 93, 94, 95, 96, 97, and 98 -	214—222
<i>Malignant tumor</i> - - - - -	224
INJURIES to the OPTIC NERVE - - - - -	225
Treatment - - - - -	226
Case 99 - - - - -	”
ANATOMY of the CEREBRAL PORTION of the OPTIC NERVE - - - - -	228
FUNCTIONAL AMAUROSIS from CEREBRAL DISTURBANCE - - - - -	231
<i>Hemipopia, visus dimidiatus</i> - - - - -	”
Treatment - - - - -	233
ORGANIC AMAUROSIS from DISEASE of BRAIN or its MEMBRANES - - - - -	235
Case 100 - - - - -	”
Nerves influenced by organic amaurosis -	240
PTOSIS - - - - -	241
Treatment - - - - -	245
Cases 101, 102, 103, 104, 105, 106, 107, 108, and 109 - - - - -	253—270
FUNCTIONAL AMAUROSIS from EXCESS of VASCULAR ACTION - - - - -	274
Treatment - - - - -	276
Cases 110 and 111, - - - - -	277—278
Causes - - - - -	279
Case 112 - - - - -	280
<i>Hemeralopia</i> - - - - -	282
Case 113 - - - - -	283
<i>Nyctalopia</i> - - - - -	”
Treatment - - - - -	284
Remarks - - - - -	”

FUNCTIONAL AMAUROSIS—from DEFICIENT SUPPLY of	
RED BLOOD - - - - -	289
Treatment - - - - -	290
Cases 114, 115, 116, and 117 - - - - -	296—303
DISEASE AFFECTING the FIFTH CEREBRAL NERVE - - - - -	306
Cases 118, 119, and 120 - - - - -	306—309
CONGENITAL AMAUROSIS - - - - -	311
OBSERVATIONS ON AMAUROSIS - - - - -	312
DISEASE of the VITREOUS BODY - - - - -	319
Case 121 - - - - -	„
FEIGNED BLINDNESS - - - - -	322
Case 122 - - - - -	326
STRABISMUS - - - - -	328
Causes - - - - -	329
<i>Congenital strabismus</i> - - - - -	330
Treatment - - - - -	„
<i>Strabismus from imitation or habit</i> - - - - -	331
Treatment - - - - -	„
<i>Strabismus from nervous influence</i> - - - - -	332
Treatment - - - - -	333
<i>Sympathetic strabismus</i> - - - - -	334
<i>Cerebral strabismus</i> - - - - -	„
Remarks - - - - -	335
ANATOMY of the CRYSTALLINE LENS and its CAPSULE	337
<i>Liquor Morgagni</i> - - - - -	338
Composition of the lens - - - - -	„
Chemical analysis of the lens - - - - -	339
Refractive power of the lens - - - - -	„
<i>Capsule of the lens</i> - - - - -	„
<i>Canal of Petit</i> - - - - -	340
Use of crystalline lens - - - - -	341
MORBID CONDITIONS of the LENS and its CAPSULE	342
<i>Lenticular cataract</i> - - - - -	„
<i>Congenital cataract</i> - - - - -	343
Case 123 - - - - -	„

	PAGE
<i>Inflammation of the lens</i> - - - - -	346
Cataract - - - - -	350
<i>Lenticular cataract</i> - - - - -	352
Cases 124 and 125 - - - - -	359—360
<i>Soft lenticular cataract</i> - - - - -	363
<i>Fluid</i> „ „ - - - - -	364
Treatment - - - - -	365
<i>Capsular cataract</i> - - - - -	367
<i>Anterior capsular cataract</i> - - - - -	368
<i>Opacity of the posterior capsule</i> - - - - -	370
<i>entire capsule</i> - - - - -	„
Treatment - - - - -	371
CONGENITAL CATARACT - - - - -	„
Treatment - - - - -	373
Cases 126 and 127 - - - - -	376—378
Use of belladonna - - - - -	380
Treatment of cataract by operation - - - - -	382
OPERATION for EXTRACTION of CATARACT - - - - -	383
<i>Of local circumstances</i> - - - - -	„
Of other disease - - - - -	„
Iris adherent to the capsule of the lens - - - - -	384
Anterior chamber small, and cataract very large - - - - -	„
naturally small - - - - -	385
Globe soft - - - - -	„
Cataract of a green color - - - - -	„
Situation of the globe - - - - -	„
Size of palpebral aperture - - - - -	„
<i>General circumstances</i> - - - - -	„
Circulation too powerful - - - - -	386
feeble - - - - -	388
Evidence of rheumatism or gout - - - - -	389
Difficult respiration - - - - -	„
<i>Considerations previous to the operation</i> - - - - -	„
<i>Instruments required</i> - - - - -	391

	PAGE
The OPERATION - - - - -	393
Position of the patient - - - - -	„
Position of the operator - - - - -	394
Inclination of light - - - - -	„
Holding the knife - - - - -	395
Fixing the superior lid - - - - -	„
Making the section - - - - -	397
Completing the section - - - - -	„
Extent and position of section - - - - -	400
Assistant to command the superior lid - - - - -	„
Laceration of the capsule - - - - -	402
Extraction of the lens - - - - -	„
Application of bandage - - - - -	404
Position of the patient in bed - - - - -	405
Application of belladonna before operation - - - - -	406
<i>Difficulties of the operation</i> - - - - -	407
Eye irritable - - - - -	„
Escape of aqueous fluid - - - - -	„
Iris liberated by irritating the globe - - - - -	408
Use of the curved knife - - - - -	„
Scissors to complete the section - - - - -	„
Double-bladed knife - - - - -	409
Section too small - - - - -	410
to be extended - - - - -	„
Iris adherent to capsule of the lens - - - - -	411
Iris wounded, forming a second pupil - - - - -	412
Capsule not lacerated - - - - -	„
Lens dislocated - - - - -	„
Hæmorrhage from central artery - - - - -	413
Cases 128, 129, and 130 - - - - -	413—415
Lens sinks in vitreous humor - - - - -	„
Fragments of lens remain - - - - -	„
Opake capsule remains - - - - -	416
Protrusion of the iris - - - - -	„
Vitreous humor in part let out - - - - -	417

<i>Operation upon an infant</i>	-	-	-	456
<i>Operation for opaque capsule</i>	-	-	-	458
<i>Capsule not absorbed</i>	-	-	-	„
OPERATION of DRILLING	-	-	-	464
Cases proper for	-	-	-	„
Mode of operating	-	-	-	465
Repetition of	-	-	-	466
Signs of absorption	-	-	-	„
Cases 133, 134, 135, and 136	-			468—473
COMBINED OPERATION of SOLUTION and EXTRAC-				
TION	-	-	-	477
REMARKS on the OPERATIONS for CATARACT	-			481
CATARACT from INJURY	-	-	-	486
Treatment	-	-	-	487
LOSS of the POWER of ADAPTING the EYE to NEAR				
and DISTANT VISION	-	-	-	489
Causes	-	-	-	490
Cases 137 and 138	-	-	-	491—493
NEURALGIC AFFECTION of the EYE	-	-		494
Treatment	-	-	-	495
ARTIFICIAL PUPIL	-	-	-	498
<i>Changing the natural position of the pupil</i>	-	-		499
<i>Enlargement or extension of a diminished pupil</i>	-			503
Cases 139, 140, and 141	-	-		505—509
<i>Forming a new pupil when the natural one has been</i>				
<i>destroyed</i>	-	-	-	509
<i>Formation of a new pupil when the original opening</i>				
<i>in the iris has been destroyed, and the lens has</i>				
<i>been lost</i>	-	-	-	512
Of SHORT SIGHT	-	-	-	519
Treatment	-	-	-	520
Of LONG SIGHT	-	-	-	521
Treatment	-	-	-	522
On the USE and CHOICE of GLASSES	-	-		523

	PAGE
ADDENDA - - - - -	527
Case of ophthalmia with ulceration of the cornea, and feeble power (142 <i>not numbered</i>) -	527
Case of unusual sympathy between the eye and stomach, subsequent to injury of the eye (143) -	530
Prevention of staphyloma - - -	538
GLOSSARY - - - - -	539

OF AMAUROSIS.

FROM *amauroo*, to obscure.

Derivation.

The derivation of the term does not give an adequate idea of its present acceptation, for this does not include the diseases of the cornea, and lens, &c., by which the sight is so frequently obscured. The same objection applies, to most of the ancient and modern terms, employed to denote this affection.

Gutta serena; cataracta nigra; dysopia; am- blyopia; mydriasis; suffusio nigra, &c. Synonymes.

The term amaurosis is now employed, to de- note a diminution or loss of sight, from distur- Definition.
bance, or change, in some part of the nervous apparatus, belonging to, or communicating with, the organ of vision.

It comprehends by far the most important of the ophthalmic affections, or those which most frequently involve loss of sight, which are least understood; and in which, therefore, medical and surgical skill prevails least.

It is only since ophthalmic diseases have been investigated, upon scientific principles, that we have begun properly to understand the great variety and importance of amaurotic affections;

and that their intricacies have been, in some degree, unravelled, so as to enable us to combat them with greater success. Our knowledge of them is still, however, far from perfect ; although their distinctions are becoming gradually more and more developed, under the light of science.

The absence of external symptoms, which characterize most of the ophthalmic diseases, renders this subject obscure ; and has, no doubt, been the principal cause of its present defective condition. Some forms of amaurosis can only be detected, and distinguished, by a most patient enquiry, aided by experience and science ; for the general symptoms of some different forms of the disease, so closely approximate, that a superficial and hasty enquiry cannot suffice, to form a correct diagnosis, upon which successful treatment principally depends.

Division.

In considering the pathology of the nervous apparatus of vision, I believe that I cannot adopt a division, which offers more practical utility, than that suggested by the anatomical arrangement of these parts.

First, therefore, I shall treat of such diseases, or injuries, as affect the retina itself.

Secondly, of such as influence the orbital portion of the optic nerve.

Thirdly, of such as affect the cerebral portion of the nerve. And,

Lastly, of such as extend through the entire nervous apparatus.

Further,—I purpose to separate the diseases in each division, into two classes—viz. :

Those, which are not attended with any appreciable change in structure, and are termed *functional*; and,

Those, which are attended with some change, and are called *organic*.

I consider as functional disease, that which is not accompanied by any change in structure, which can be detected, and decided to be the result of a morbid action. Our knowledge, at present, only enables us to determine, with any accuracy, on such changes, in the solid or firm textures of a part or organ; whilst, at the same time, there may exist various morbid conditions of the fluids; especially in respect of superabundance or deficiency, which the most experienced and diligent pathological enquirer cannot determine to be the result of a morbid action, nor distinguish from a change produced during the expiring vitality of the part.

The fluids are, strictly speaking, as much a part of the organization; as the solids; and any morbid condition of them, ought, properly, to be termed organic; as much as if it occurred in the firm textures. But the foregoing explanation of the term *functional* is that, which I believe to be

most generally accepted, and which I shall adopt as facilitating description, and enabling me to give it with more practical utility.

Other distinctions, or divisions, of amaurosis exist, arising from the degree, the extent, the duration, or the cause, of the disease; which, though, for the most part, obvious, I shall point out, in order that I may be clearly understood, in the subsequent use of the various terms.

Amaurosis is perfect, complete, or entire, when the organ is insensible to the impression of light.

It is imperfect, whilst any degree of sensibility exists in the retina, but when the entire field of vision is obscured.

It is incomplete when a part or parts of the field of vision is, or are, obscured, whilst another part or parts retain their ordinary sensibility.

It is temporary or intermittent, when the vision is obscured or lost, for short periods; but is perfect or good in the intervals of the amaurotic attacks.

The diseases or injuries which affect the retina itself are,

First,—the diseases of the choroid membrane; for, from the proximity of this tunic to the retina, very slight morbid action in the former, influences the functions of the latter; and severe or continued disease of the choroid, often extends to the retina, and leads to organic change in it.

Secondly,—various other circumstances affect the functions of the retina, independent of any other texture. And,

Lastly,—the retina is liable to inflammation, which produces disorganization.

The diseases which influence the orbital portion of the optic nerve, principally arise in the orbit, and consist of tumors of various kinds. This part of the nerve is very rarely subject to disease, which commences in it ; but it, occasionally, participates in morbid action, which commences in the retina, or in the orbit.

The diseases, which affect the cerebral portion of the nerve, are produced by congestion, or inflammation, leading to effusion in the course of the optic nerve ; or that portion of the brain immediately connected with the functions of the nerve.

The entire nervous apparatus of vision is affected, simultaneously, either by excess or deficiency of blood in its circulating vessels : the former produces pressure, which impedes or destroys the nervous function ; whilst the latter renders the apparatus incapable of maintaining its proper function.

A N A T O M Y
OF
T H E C H O R O I D.

Derivation. **THIS** tunic is named from its resemblance to the chorion.

The choroid membrane is placed within the sclerotic, to which it adheres, loosely, by cellular tissue, and more firmly, but much less extensively, by blood vessels; and it extends from the entrance of the optic nerve to the ciliary circle, near the junction of the cornea and sclerotic. Its internal concave surface presents no points of adhesion, and is lined by a thin and very delicate membrane, which is reflected between it and the retina. Posteriorly, the choroid commences around the entrance of the optic nerve, by a slightly elevated ring: but it has not any connection with the nerve: anteriorly, it is continuous with the ciliary circle, and ciliary body.

Its structure is nearly altogether vascular, and it is colored of a dark brown tint, by a pigment, which it secretes.

The convex, or external part of this tunic, presents, posteriorly, or near the optic nerve, an arterial network from the first interlacement of the short ciliary arteries ; and, anteriorly, and to a much greater extent, this surface of the membrane is formed of veins, having a beautiful arrangement, of arborescent character, and termed *vasa vorticosa*.

Between the sclerotic and choroid pass numerous nerves, with some arteries which may be traced to the ciliary circle anteriorly ; these are the ciliary arteries and nerves, which belong, principally, to the iris.

The concave, or inner surface of the membrane is formed of a very fine and extremely delicate arterial network continued, principally, from the short ciliary vessels, or the interlacement formed by them on the outer surface, as before mentioned. The numerous vessels, which compose the choroid, are intimately united together by cellular membrane, and constitute a single tunic ; for no division can be made by the ordinary anatomical means, as some have supposed.

The arteries of the choroid are principally derived from the short ciliary vessels, which perfo-

rate the sclerotic, near the entrance of the optic nerve : these arteries contribute little or nothing to the supply of the sclerotic, but merely pass through it, to the choroid, to be distributed as I have described : anteriorly, however, the arteries of the choroid communicate or anastomose freely with those of the sclerotic, iris, and ciliary body, at or near the ciliary circle ; and the veins of the choroid, receive the veins from the same sources, especially from the iris and ciliary body.

The color of the choroid depends upon the presence of a quantity of pigment, which appears to be secreted from the inner surface of the membrane ; and which has a deep dark brown tinge, like sepia. This colored secretion is most abundant, and of deepest hue, towards the posterior part of the choroid ; and it is also found in abundance, on the ciliary processes, and at the back of the iris. If the eye be examined a few hours after death, the pigment is retained altogether in the choroid membrane ; but if the examination be delayed, for a little time, the inner surface of the sclerotic is found tinged by the coloring matter, which has exuded from the membrane ; but the retina does not exhibit any discoloration, which is, upon a close and careful examination, accounted for, from the intervention of a very fine and delicate membrane, which

is double, and reflected between the choroid and retina : one layer, the inner, appertaining to the retina, having been described by Dr. Jacob, of Dublin ; and the other, belonging to the choroid, having been particularly pointed out by Mr. John Dalrymple, who has also demonstrated that the two portions of membrane are continuous, posteriorly, around the projection of the optic nerve ; and, anteriorly, at the commencement of the ciliary body, so that a shut sac is formed, similar to most serous membranes, to which class this ocular tunic belongs.

When the choroid is separated from the retina, and submitted, for a short period, to maceration, in clear water, the serous membrane may be separated from the choroid, in fine floculi tinged with pigment, and considerable portions can be detached, by very careful manipulation with a small camel's hair brush. Further, maceration for two or three days in water, frequently changed, deprives the choroid of its coloring matter, and renders it nearly white.

The pigment, separated by maceration, is found by microscopic observation, to be composed of minute globules, which elicit, under chemical analysis, a large proportion of carbon and iron.

The secretion is more abundant in the young subject, than in those advanced in life ; and, sometimes, in old persons, it is very scanty. It

differs, also, in quantity and density, in different individuals.

The pigment is of essential service, as it absorbs a large portion of the light admitted by the pupil, and thereby prevents reflection of the rays, which would greatly confuse vision; and which is the cause of the defective sight of albinos animals, in whom the coloring matter is absent.

OF THE CILIARY BODY AND PROCESSES.

ON the inner surface of the choroid, towards its anterior termination, numerous folds or plicæ are found, which commence almost imperceptibly, but with great regularity and uniformity; and gradually increase as they are traced forwards, and a little inwards, when each fold terminates, in a delicate, folded, leaf-like process—the plicæ or folds, have been termed the *ciliary body*, and the leaf-like extremities are known as the *ciliary processes*; they are usually between seventy and eighty in number, and are alternately long and short.

Externally, the ciliary body is continuous with the choroid; and, internally, it rests upon the hyaloid membrane; which is strongly marked by the folds of the body:—anteriorly, the ciliary body is connected with the ciliary circle, iris, and ciliary processes.

The ciliary processes are placed immediately around the circumference of the crystalline lens,

which they frequently overlap a little ; they are supported, posteriorly, by the hyaloid membrane, and anterior layer of the *Canal of Petit* ; anteriorly, they are opposed to the posterior chamber of the eye, being covered by the membrane of the aqueous humor, and separated from the iris, by the aqueous fluid : the free extremities, directed inwards, do not seem to be connected with the capsule of the lens ; the bases, directed outwards, join the ciliary body and circle.

The ciliary body and processes are, as the choroid, extremely vascular ; and each process exhibits one principal artery, with numerous branches, having frequent anastomoses. The arteries are derived from the ciliary, and the veins communicate with the ciliary veins and the vasa vorticosa of the choroid. The vessels anastomose with those of the sclerotic and iris, through the ciliary circle.

The pigment abounds in connection with the ciliary body and processes.

The use of the processes has not been decided.

OF THE MORBID CONDITIONS
OF
THE CHOROID.

FIRST, I believe that there is frequently a partial distension of the vessels of the choroid, which, by pressure, disturbs the functions of the retina.

Secondly, that there occurs a partial preternatural dilatation, or varicosity of its vessels, which is permanent; and which also affects the retina.

Thirdly, that it is liable to congestion of a temporary kind, affecting a large part, or the whole of the vascular structure, which disturbs or destroys the power of the nervous tunic or retina.

Fourthly, it is subject to inflammation of acute and chronic kind, which, by vascular connection, soon extends to the iris and sclerotic; or, by

morbid deposit, to the deeper tunic and humors of the globe. The result of inflammatory action, I believe to be, most frequently, deposit of fibrin ; and, more rarely, an effusion of serum.

OF PARTIAL TEMPORARY DISTENSION OF
THE VESSELS OF THE CHOROID.

MUSCÆ-VOLITANTES.

Synonyme.

In the most simple cases, the patient imagines, Symptoms. at first, that some extraneous matter has lodged upon the surface of the eye, or floats at a short distance before him ; and makes frequent attempts, by rubbing or wiping the eye and eye-lashes, to get rid of the spot or spots, which interfere with the field of vision ; or, if he be reading or writing, he may suppose that some extraneous matter has lodged on the paper, and he tries to brush it off. The slight interruption to vision becomes more apparent, as the eye is directed to a light ground, and less distinct, in proportion as the ground is dull ; altogether disappearing, when the ground regarded absorbs the rays which fall upon it, as when very dark or black.

The imaginary objects assume a great variety, as regards size, figure, number, &c. ; but are

always of a greyish or dark hue ; sometimes appearing of a very light grey, and semi-transparent, as a drop of fluid upon a glass ; or perfectly opake and black, as a drop of ink.

The most common form of this affection, consists in the appearance of fine curved lines, sometimes single ; but, occasionally, bifurcating, or with several small projections ; as the minute twigs emanating from a small branch. Whether single or with ramifications, the lines have a semi-transparent greyish appearance ; and, upon attentive observation, minute opake spots may be discovered within the lines ; the whole presenting a character, very similar to that, which may be seen when viewing the delicate vessels in the web of a frog's foot, or in the tail of the tad-pole, under the field of the microscope ; when some of the extreme vessels, nearly transparent, are seen with an occasional opake particle, or a globule of red blood circulating through them.

The patient, subject to this affection, has usually several of these lines present in the field of vision, at a time ; and, as he moves the eye, the lines appear to change their position. If he look upward towards the sky, the lines seem suddenly to ascend ; but whilst he keeps the eyes fixed upward, the lines appear gradually to fall downwards ; and the slightest motion of the

organ is sufficient to produce a change in the position of these imaginary objects ; so that it is a matter of difficulty to fix them in such a manner, as to define their precise character and extent ; and often, in endeavouring to effect this, the patient finds the lines to become more extended, or fresh lines to appear during the effort : but, when the affection has existed for a day or two, or when a person has experienced several attacks of this kind, he acquires a greater facility in fixing them ; so as to be able to describe the nature of the appearance pretty accurately.

Not unfrequently, with these lines, there appear also small opaque spots ; but, more frequently, such spots occur independent of the lines. It is very common for a patient to suppose that a small flake of soot has lodged upon the eyelash, or on the paper, he may be regarding ; or that it is floating in the atmosphere, at a short distance before the eye. Now and then, there are more than one of such spots apparent ; and, occasionally, they are more numerous still. When attention is given to them, they appear to move as the eye is moved, in a manner similar to the grey lines ; and the patient becomes satisfied that there is no extraneous matter present, but that there is some defect in the organ of vision.

Again, frequently, patients are troubled with

small grey or dark spots of almost endless variety, in size, figure, and number. They, sometimes, present a small rounded or oval figure, with a single projecting limb ; resembling, somewhat, the figure of the tad-pole. Sometimes, there are two or more projecting limbs ; so that the object has a resemblance to a small grey or dark insect, with legs or delicate wings extending from the body ; such as a fly, a gnat, a spider, a beetle, &c. So frequently, however, are they described as appearing like small flies, that the term *musca* has been used to denote the affection ; and this term is now generally employed, by ophthalmic surgeons, to all the varieties of lines, spots, and irregular figures, of a grey or dark kind, which so frequently disturb the vision. It would be an endless task to attempt a description of the varieties of these objects. I much regret that I have not preserved the diagrams or plans of such appearances, which have, from time to time, been brought to me, by different patients. They would have formed a curious collection.

The duration of these *muscæ* varies very much. Sometimes they appear only for a few minutes, and then disappear ; more frequently, they can be perceived for hours together ; and, occasionally, they continue for days : but, under neglect, they often become permanent. The

greyish lines, which I have first described, do not appear, usually, in precisely the same position, or of the same size and extent. Such is also the case with the grey or light spots; but, those of a dark or black aspect usually occupy the same point in the field of vision: the former rarely become permanent, the latter frequently do so. At the time the patient experiences this troublesome affection, he has also, generally, some other evidence of derangement, in the circulation of the eye; as a sense of fulness or tension, and, occasionally, a slight degree of pain.

The most attentive examination of the organ Appearances. rarely elicits any thing satisfactory. Generally, I have observed that the pupils have been rather more contracted than usual, and the motions of the irides somewhat sluggish; but, in a few instances, I have found the pupils rather more dilated than natural: so that there is no local sign, which would particularly indicate the cause of this disease.

I believe that the *muscæ*, which I have de- Causes. scribed, result from disturbance in the circulation of the choroid tunic, and depend upon a preternatural dilatation of some of its delicate vessels; although it is difficult to account for the great varieties which the *muscæ* present, on such a supposition. I cannot consider them, when of an evanescent character, (which nearly

all the varieties occasionally are,) as the result of a morbid deposit; because I hardly conceive, that such a deposit could take place, and again be removed, with a rapidity, equal to the appearance and subsidence of the *muscæ*. I shall, by and bye, further explain, why I consider the grey or dark spots to result from morbid affection of the choroid, influencing the delicate nervous tunic within.

Persons of dyspeptic habit, or those subject to frequent gastric disturbance, are particularly liable to these evanescent *muscæ*; and they usually experience, at the same time, giddiness or head-ache, and frequently a feeling of nausea; and the circulation is often much disturbed—the pulse being frequent and jerking, and, sometimes, irregular in its beat. The dark *muscæ* occur in those who are subject to occasional gastric disturbance, and who use the eyes much for minute purposes; or they occasionally appear in persons of a plethoric habit, who indulge in the luxuries of the table, without much exertion of the eyes either in matters of business or amusement. Thus, in the first instance, the *muscæ* depend upon irregular circulation, and local congestion, induced simply by gastric functional disturbance. In the second place, the local mischief is promoted by excessive use of the organs; there being a disposition to local congestion from

a disturbed state of circulation, again consequent on gastric derangement. And, thirdly, the delicate organs of vision suffer, in common with the other parts, from extreme tension of the vascular system, produced by excess in diet.

It is very uncommon to find a person, under the age of puberty, subject to *muscæ*, unless resulting from decided inflammatory action; but they are very frequent in persons from sixteen or seventeen years of age, and upwards, till an advanced period of life, when their occurrence is much less often found.

When the *muscæ* are evanescent, and evidently connected with gastric or intestinal derangement, the principle of treatment must be obvious; viz., to correct the error of function in the stomach or bowels;—and I must be satisfied with naming the principle, without describing the means; as I have neither space nor inclination, to enter into a subject of such vast extent, and so complex, as the treatment of dyspepsia. It frequently, however, happens that the disease is promoted by over exercise of the eyes, in addition to the gastric, hepatic, or intestinal, disturbance; but, in such cases, the *muscæ* are usually more numerous, and darker, and are not so evanescent: besides, the patient generally has more uneasiness in the eyeballs or forehead. Now, under such circumstances, something more is re-

Persons
liable to.

Treatment.

quired, than mere attention to stomach, &c. The patient should abstain from using the eyes on minute objects; or for much time, continuously, on those of moderate size; he should avoid exposure to bright lights; and if pain or uneasiness continue about the eyes or forehead, counter-irritation by mustard plasters, or small blisters to the temples or forehead, will often prove very serviceable.

Supposing that the muscæ occur without any evident derangement of the alimentary viscera, but appear to be principally induced by over use of the organs, rest of the eyes, and avoidance of bright lights should be enforced; and counter-irritation also resorted to, in case of local uneasiness or pain of continued kind; and, at the same time, general means should be employed to correct error in the circulation, and lessen the tendency to local congestion; such as I shall explain, after I have described the condition, denominated *Impaired Vision*, which usually exists, in some degree, in connection with the muscæ which are caused by over exertion of the eyes.

The muscæ, which are produced by too full a condition of the vascular system, are also attended with a general affection of the function of the retina, termed *impaired vision*; and their treatment will properly come under that head.

OF VARICOSITY OF SOME OF THE VESSELS
OF THE CHOROID.

FIXED muscæ.

Synonyme.

The fixed or permanent muscæ, I consider to be the result of a partial morbid enlargement, or varicosity, of a choroideal vessel or vessels; or to be produced by a morbid deposit, in or upon the choroid, which presses upon the retina. The musca, which is occasioned by the pressure of a varicose vessel, frequently occurs without any further disturbance of vision, and is usually of sudden origin; though, occasionally, it is preceded by the evanescent spots; and it often appears without any signs of congestion, ocular or cerebral.

The musca, which is produced by a morbid deposit upon or in the choroid, usually occurs with some general obscurity of vision, or remains after the reduction of inflammatory action which has affected the choroid coat. I have come to this conclusion, in consequence of finding that the fixed muscæ, which arise in a field of vision,

otherwise clear, and without evidence of inflammatory action, are rarely, if ever removed; whilst those, which occur with a general disturbance of the function of the retina, and are attended with signs of inflammation, frequently disappear as the inflammatory action is subdued.

When, therefore, a single spot, or a few spots, occur in the field of vision, without symptoms of inflammation or disturbance of retina, generally, I feel but little inclination to adopt any treatment with a view to remove them; but I am careful to caution the patient against the exciting causes of choroid congestion. I have, formerly, in many instances, treated such cases by active, and by alterative and continued means; but with so little success, that I am now content simply to arrest the progress of the affection. Patients with such affection soon become reconciled to it, when they find that it does not impede vision. Several persons, whom I have opportunities of seeing often, have had these fixed *muscæ* for years, but they have become so accustomed to them, that they are rarely conscious of their existence, unless asked about them.

The *muscæ*, which depend upon some morbid deposit, as resulting from the effects of inflammation, should be treated as cases of chronic disease of the choroid, which I shall presently describe.

OF TEMPORARY CONGESTION OF THE CHOROID.

IMPAIRED vision.

Synonyme.

The most simple form of this disease arises from sudden change of position, and almost every one must be familiar with it—I mean, the confusion, or dimness of vision, which results from suddenly stooping; the dimness of vision is experienced immediately on re-assuming the erect position; and, is frequently accompanied with a sensation of giddiness, or a fulness of the head; but all these symptoms subside, after a few moments or minutes: they result from an unusual determination of blood to the head and eye, occasioned by suddenly placing these parts below the position of the heart; so that the gravity of the circulating fluid is superadded to the force of the heart and arteries.

Frequently, however, a similar confusion of vision occurs, independent of any change of position, but, during the time that the eyes are

employed on minute objects, or in regarding intense or brilliant light; usually, in the commencement of this affection, after the eyes have been engaged for some time, on minute objects, the patient experiences a degree of confusion; the objects becoming partly or wholly obscured, as if covered by a network or mist; but after resting the eyes for a few moments, and rubbing or pressing them slightly, the vision again becomes distinct;—this occurs again and again, and the disturbance of vision is excited more readily, and more rapidly, the more the vision is exerted; and a longer period of rest is required for the subsidence of the effect, in proportion as the rapidity of the effect is produced. After some time, a slight attempt to view minute objects reinduces the obscurity; and, eventually, the vision remains cloudy or dull, as if a piece of gauze, or a thick veil, intervened between the eye and the objects regarded. This condition of vision is frequently preceded or accompanied by dark or grey muscæ; and is usually attended by a sense of fulness in the eyeball, and a weight or uneasiness about the forehead.

Appearances.

In the majority of these cases, I have noted that the pupils have been of small size, but the motions of the iris usually free—in many instances, however, I have found the pupils larger than natural, and the movement of the iris rather

sluggish : this has been more especially the case, when the disease has materially affected the power of vision, or has been of long duration ;— occasionally, also, a few large and tortuous conjunctival vessels exist, distended with dark red blood : frequently, no unusual appearance can be detected.

Over exertion, or excess of stimulus of light, Causes.
producing local determination.

All persons who are compelled to use the eyes, Persons
for many hours continuously, on minute work; are liable to.
especially liable to this affection ; as watchmakers, jewellers, compositors, milliners, tailors, shoemakers, &c. Again, those who use high magnifying powers, especially with the aid of a strong light ; further, those whose occupation exposes them to intense or brilliant lights.

The disease is much influenced and modified Modifications.
by the condition of the general health, and occurs in two very opposite states of general power. First, and most frequently, it occurs or arises when the action of the heart and arteries, generally, is below par, or feeble. Secondly, when the vessels are pretty fully distended, and the action of the heart and arteries unduly violent ; the disease, nevertheless, exists when the circulating system is apparently tranquil and natural. Any important functional derangement, also, materially affects the local ocular congestion ; for in-

stance, we have frequent examples of impaired vision, in delicate females, who are, at the same time, subject to irregular or improper uterine action—and, rarely can we succeed in subduing the ocular disturbance, until the uterine functions are properly reinstated.

Treatment.

In treating impaired vision, it is first necessary to ascertain the condition of the general power : if it be deficient, the general aspect of the patient, the condition of the pulse, and the influence of food, or position, on the vision, will afford the best indications ;—the patient will be pallid, the pulse easily compressible, though, perhaps, frequent in its beats ; and the vision will be improved by a nutritious meal, or by the recumbent posture : under these circumstances, the secretions being properly regulated, the general power should be improved, by good nutritious diet and mild tonic medicinal remedies. If the vascular system be surcharged, the countenance will usually be flushed, the skin hot, the pulse full and incompressible, and the symptoms augmented, or more readily induced, after a full meal, or when the patient is in a reclining posture. Relief will now be obtained, by lessening the tension of the vascular system, either by the immediate abstraction of blood, or by acting freely on some of the more important secretions ; and by a very simple light diet, without stimuli.

Supposing the action of the heart and arteries, generally, to indicate neither deficiency, nor excess of power, it will be simply necessary, to pay attention to the state of the principal secretions.

Independent of the general treatment, under all circumstances, it is essential, that the organs should be rested, and kept, as much as possible, from the excitement of work, and bright light. If there be a sense of fulness or uneasiness in the eyes, or about the forehead, counter-irritation should be resorted to, in a moderate degree, by mustard plasters, liniment of ammonia, small blisters, &c.

Should the disease not yield to the fair trial of these means, a mild alterative medicinal plan should be instituted, as minute doses of mercurial with some mild tonic, as sarsaparilla, cusparia, &c.; provided that there be no excess in the force of the circulation.

The adoption of this plan of treatment, in all respects, is easy, except as regards one circumstance, which is of the greatest importance, viz., the rest of the eyes.

The disease is, as I have stated, extremely common among those who have to obtain their livelihood, and perhaps to support a family also, by work, which cannot be followed without much exertion of vision, and which cannot altogether

be given up. I have generally found that such cases can be cured, by carefully regulating the labor of the eyes, and steadily persevering in the other means which I have detailed;—by regulating the labor of the eyes, I mean, dividing the work, so as to prevent congestion, and giving intervals of rest, for the recovery of tone in the organs, to carry them through a fresh period of employment: thus, supposing a patient could work for an hour, but not longer, without producing disturbance of vision, he should then be directed to work only for half an hour, at a time; and to allow intervals of rest, of a quarter of an hour each: he can thus work for two-thirds of his usual time, while his cure proceeds. The period, to be employed at work, and the intervals of rest, should be regulated by the character of the affection:—as a principle, it may be stated, that the period, allowed for employment, should be short of that in which application produces the disturbance of vision; and the time devoted for resting the eyes, should never be less than a quarter of an hour.

Supposing that the impaired vision occur within half an hour, or less, after the eyes have been employed at work, it is best for the patient to refrain from work altogether, for a week or two, until the affection be mitigated; for he could hardly adopt the plan above recommended, in

less urgent cases, as the period allowed for work, would be too short for him to gain much advantage by his labor: in all cases, the use of the eyes, with the aid of artificial light, should be avoided; and, in those cases, in which the disease has been promoted, by excess of light, it should be modified, by artificial means, when the patient is allowed to resume his employment; and, for this purpose, the thin plain glass, having a very slight black tinge, is, in my opinion, the best.

From whatever cause the condition of impaired vision may have arisen, there is, always, a tendency to a similar disturbance; and the patient should therefore be warned not to use the eyes too much, or to expose them to powerful or brilliant light for a long period.

If the affection, termed impaired vision, be Consequences. neglected, a slow inflammatory action is instituted, which I have next to consider.

INFLAMMATION OF THE CHOROID.

WE recognize two forms of inflammation of this texture, acute and chronic; the latter is much the more frequent, and I shall, therefore, first describe it.

CHRONIC INFLAMMATION OF THE CHOROID.

Synonyme.

CHOROIDITIS.

Symptoms.

More or less of functional disturbance of the retina usually precedes inflammatory action of a sub-acute kind, in the choroid tunic, such as I have before described; as *muscæ*, or as impaired vision: and, sometimes, such disturbance continues for months or years, before inflammation supervenes. The commencement of inflammatory action is indicated, by the continual appearance of a network or cloud, which obscures, par-

tially or entirely, the field of vision—sometimes, it is spread over only a small portion or portions of the space ; but, occasionally, covers the whole : most frequently, it appears as a piece of dark gauze or network ; less frequently, as a cloud or mist : and, occasionally, patients describe the imperfection, as if produced from an irregular spot or spots, made by smearing the objects regarded with Indian ink or sepia : sometimes, the portions of the field of vision, not occupied by these spots, are tolerably clear ; but, most frequently, there is a general haze ; and, often, the patients complain of many smaller and darker specks or muscæ.

The above described symptoms, may exist for weeks, months, or even years, without much augmentation ; but, in most instances, a gradual increase takes place, until vision is lost ; and, occasionally, a sudden acute attack supervenes, and vision is perfectly obscured in a few hours.

The symptoms are aggravated by sudden emotion, by anxiety, by disorder of important functions, as of the stomach, &c., by sudden changes of weather, especially from a dry condition of atmosphere to cold and damp, or by whatever tends to disturb the balance of the circulation.

If the disease be of very slow progress, the patient seldom experiences any pain or uneasi-

ness in the eyes, unless at the time of sudden augmentation of the symptoms, from mental influence, sudden change of temperature, &c.; under which circumstances, a sense of fulness, and, sometimes, tenderness of the globe, occurs; and this is more frequent and severe, in proportion as the disease is rapid in its progress: patients also, occasionally, complain of weight or uneasiness about the forehead.

Appearances.

When inflammatory action has commenced, the iris becomes rather dull, and the pupillary aperture is, at first, frequently contracted; but, as the vision becomes impaired, it gradually dilates, to an extent somewhat larger than is natural, and the movements of the iris are tardy.

These are the only circumstances to be observed, whilst the inflammation is confined principally to the choroid; but, by degrees, the iris becomes implicated in the diseased action, when its brilliancy is destroyed, its color changes as in simple iritis, the pupillary margin thickens, becomes irregular, and adherent to the anterior capsule of the lens, and the transparency of the capsule is affected.

When the disease is very slow in its development, the changes above described sometimes take place, without any apparent increased vascularity of the superficial tunics; but, most frequently, the vessels of the sclerotic, immediately

around the margin of the cornea, become slightly injected with red blood, forming a zone of a pale dull red color ; and, at the same time, a few tortuous vessels, filled with dark colored blood, appear in the conjunctiva.

In some cases vision is destroyed, with little change in the appearance of the iris, probably, from thickening or deposition in, or in connection with, the choroid ; but, in most instances, perception of light remains, and the changes I have described in the iris and capsule of the lens take place.

Now and then further changes are induced, by the continuance of the disease—the sclerotic, at one or more parts, becomes thinned and projecting, constituting *staphyloma scleroticæ*. This may arise either from varicose enlargement of some of the sclerotic vessels, or from an effusion of serous fluid ; I believe the latter to be the more frequent cause, for I have, occasionally, punctured these projections, and evacuated the serous fluid ; and, I have known them burst and allow the escape of a similar secretion ; but, I have never known blood to exude under the like circumstances. The effusion of serum, which takes place, sometimes presses upon the retina, separates it from the choroid, and forces it upon the vitreous body ; and the vitreous fluid becomes absorbed, according to the extent of the

pressure ; at the same time, the retina is thickened, and disorganized ; and the symptoms of chronic retinitis are superadded to those of chorooiditis.

OF ACUTE CHOROIDITIS.

THE acute form so rarely occurs without previous symptoms of chronic disease, and the chronic affection is so apt to assume an acute character, that I consider it best to describe the acute disease, before I explain the causes, modifications, &c. ; which, indeed, are so similar in connection with the two forms of choroiditis, that unnecessary repetition would result from a different arrangement of the subject.

The acute disease is indicated by deep seated Symptoms. pain of a dull and throbbing character, with occasional shooting, and a sense of fulness or tension of the globe, which becomes tender to the touch ; the vision is rapidly disturbed, the field being obscured by grey or dark spots, as well as by a dark gauze or general mist. Usually, at first, the disturbance of vision is unequal, one part of the field being obscured more than another ; and, most frequently, the obscurity is greatest at the inferior part. There is often a

dull circum-orbital pain of a remittent character, and pain, or sense of weight of the forehead. These symptoms augment rapidly, and vision is soon destroyed.

Appearances.

The eye appears partially red or inflamed, and the redness is dull and of a brick-dust color : a close inspection shews, that the redness results from many of the small vessels of the sclerotic being distended with red blood ; and they can be traced, passing from the margin of the cornea, radiating in all directions, being most abundant near the cornea ; a few tortuous vessels of the conjunctiva are also usually visible, and may be easily traced as superjacent to those of the sclerotic, over which they may be made to move, by pressing the former membrane.

The iris soon becomes dull, the pupil contracted, and its margin irregular ; and by degrees the membrane gets discolored, and its pupillary margin thickened, and it becomes attached by points, to the anterior capsule of the crystalline lens. Subsequently, the capsule of the lens becomes opake, or covered by a deposition of opake fibrin. In very aggravated or protracted cases, the sclerotic coat gives way, usually near to its corneal termination ; and an irregular projection results, forming *staphyloma scleroticæ*, similar to that which results from the chronic disease. Now and then the morbid action ex-

tends to the retina, and vitreous body ; and such organic change takes place that permanent and incurable amaurosis follows. Under these circumstances, the globe generally loses its elasticity, and becomes soft and flaccid. I believe that the diseased action, in these instances, is propagated to the retina and vitreous body, much in the same way that it is from the iris to the capsule of the lens ; namely, that a deposit of fibrin first unites the choroid and retina ; and that this deposit, becoming organized, establishes a vascular communication, by which morbid action is readily conveyed from one texture to the other ; and thus again it passes, by similar means, to the deeper tissue.

Are principally such as I have already mentioned in describing *muscæ* and impaired vision ; but the disease originates, also, independently of the causes alluded to, and appears to be the result of an unhealthy state of system, arising in those in whom a strumous diathesis is evident ; and, in such instances, the local disease is probably induced by violence, by the influence of cold and damp, or some one of the ordinary causes of local inflammation.

Those who have been once subject to this affection are very liable to its recurrence.

When symptoms of congestion, or of chronic inflammation, have appeared, the acute disease is

easily induced by too much exertion of the organ, or by exposure to bright light, or to a cold wind.

Persons
liable to.

Choroiditis occurs usually in persons under the middle period of life, and is not uncommon in the infant; but it prevails more at the period of life, in which the organs are most employed for minute purposes. Under the age of puberty, the disease is rarely seen, excepting in patients who evince a scrofulous diathesis; and at a more advanced period of life, such as present this constitutional peculiarity, are more especially liable to this affection. It is more frequent in females than males.

Modifications.

The disease is influenced much in its progress and termination by the condition of the general health, its ravages being more rapid and more fatal to the organ, in proportion to the feebleness of the constitutional power. In the young and delicate female, derangement of uterine function has a very material effect upon the disease. A very remarkable case, shewing the connection between the disorders of the two organs—viz., the uterus and the eye, came under my observation several years since.

Case.

63. A fair and slender girl, thirteen years of age, was brought to the Ophthalmic Hospital, having lost the sight of one eye, and the vision of the other being very much injured, in conse-

quence of inflammation, which had originated in the choroid. The disease had commenced with the appearance of muscæ, and a gradual formation of a gauze or web over the field of vision ; the extent and density of which had for a time varied very much, but had eventually become permanent, and increased so as to destroy perception of light in the one eye, and to deprive the patient of all useful vision in the other. The eye, in which the disease had annihilated the function of the retina, was slightly atrophied ; the globe being soft, the iris being dull and discolored, and the pupillary margin adherent to the anterior capsule ; the pupil itself being very much contracted, very irregular, and occupied by a very opaque membrane. In the other eye, with which she could then distinguish the outlines of large objects when placed in a favorable light, there was a dull and discolored condition of the iris, and the pupil was irregular, its margin being adherent to the anterior capsule of the lens, and some opacity of this membrane existed ; not, however, of sufficient extent to account for the imperfect state of vision. She was placed under a mild alterative treatment, and took, principally, minute doses of the bichloride of mercury, with sarsaparilla ; occasionally, a mild aperient was administered, and her diet consisted of plain nutritious food without stimulus, as

wine, &c. This plan being persisted in, with occasional trifling modification, for more than twelve months, a very considerable improvement of vision took place ; the patient being able to recognize persons, and to guide herself with tolerable facility.

Suddenly, however, it appeared that all our care and perseverance had been fruitless, although the strictest attention was given to a continuance of the plan. The patient lost all but the perception of light, the eyes became painful and tender, especially the more perfect one, in which she had a distressing sensation of distension. I found the vessels of the conjunctiva and sclerotic, in both eyes, injected with red blood ; but mostly so in the best eye ; and the anterior chamber of this organ was nearly filled with a dark colored blood ; and that portion of the iris, which was still visible, exhibited a much greater degree of discoloration than had previously existed. I directed some leeches to be applied upon the inferior eyelids, and ordered a brisk aperient immediately, with small doses of calomel and opium as soon as the aperient had operated. The leeches were to be repeated, if the local suffering continued or returned ; and her diet was directed to be lessened.

Upon her next visit at the institution, after an interval of four days, I was much surprised,

but gratified, to find that nearly all these additional untoward symptoms had disappeared; that the eyes had regained the characters which they presented, before the distressing attack, and the power of vision had returned, so that she could again guide herself.

All now remained quiet for a few weeks, when a similar attack came on, without any very obvious reason; and, as the former one, it disappeared in the course of three or four days, under a similar plan of treatment.

Again, after an interval of a few weeks, the same unfavorable symptoms recurred; when by referring to the paper upon which the dates of her visits, prescriptions, &c., had been noted down, I found that these attacks had come on at regular periods, a month intervening between each; and I could not but suppose that the attacks were connected with the nondevelopment of proper uterine function; for she was now between fourteen and fifteen years of age; and I discovered, upon further enquiry, that previous to each aggravation of the ocular symptoms, she had experienced pains in the region of the uterus, and the loins. Besides, I could hardly suppose that the urgent symptoms, which I have described, would be so readily and effectually removed, in the course of three or four days, by the treatment adopted; it appeared much more

probable, that the subsidence of the attacks resulted from the cessation of an effort made to establish the menstrual secretion. With this view of the case, I contented myself with promoting rather a free action from the bowels, &c., during the continuance of the urgent symptoms; and, as soon as they had disappeared, I prescribed small doses of steel, with an occasional mild aloetic purge; and directed the mother to remind me of the next occurrence of the uterine or lumbar pains. These occurred about the time expected, when I directed that she should use a hip bath in addition to the other remedies. The catamenia appeared, and continued for about the same period that the acute symptoms in the eye had formerly existed; but the eyes now remained perfectly quiet. Thus clearly shewing the connection between the ocular affection, and the functions of the uterus.

I regret to state, however, that two or three years after, my patient lost her vision entirely; the general health became materially deranged, and inflammatory symptoms again appeared in the eye, and it became disorganized, whilst I was endeavouring to improve the general health.

I have seen several other examples of chronic choroiditis, about the same period of life, and have observed that the ocular disease was much influenced by disorder of uterine function; but I

have not seen any other instance in which a periodical effusion of sanguineous fluid took place into the anterior chamber.

The progress of inflammation in the choroid tunic varies extremely, as well as the extension of the morbid action to the iris, sclerotic, capsule of the lens, retina, &c. Thus, in some cases, the disease is confined, for a long period, to the choroid, before there is any important affection of the iris; whilst, in other instances, the iris participates in the morbid action, soon after inflammation is set up in the choroid: usually, a long period elapses before the disease extends to the retina, and vitreous body, though, occasionally, symptoms of retinitis are presented at an early period.

The extent of mischief in the choroid is indicated by the degree in which vision is disturbed, or lost; whilst the pupil remains clear, the changes in the brilliancy and color of the iris, the irregularity of the pupil, and the extent of injection of the vessels of the sclerotic with red blood, which are easily detected by examination of the organ, prove the degree of inflammatory action in the iris, &c.; and the appearance of sparks, colors, and flashings in the organ, evince affection of the retina, whilst the shrinking of the globe, or partial atrophy, which is caused by

absorption of vitreous fluid, proves that diseased action has extended to that body.

Inflammation of the choroid, as a primary disease, either in an acute or chronic form, is not very common ; yet, I believe, it is but indifferently understood,—being frequently confounded with iritis, of which it may be the cause ; for the very intimate vascular connection, between the choroid and iris, hardly admits of the existence of inflammation in one, without the other becoming affected, if the morbid action be continued for a few days. In consequence of this free communication of vessels, choroiditis, therefore, sometimes produces iritis, and iritis produces choroiditis.

It is a matter of considerable importance to form a correct diagnosis, since the success of treatment mainly depends upon it. I shall, therefore, point out the marked differences in the early symptoms, and, I hope, render the diagnosis of the primary disease simple.

In choroiditis, disturbance of vision precedes any alteration in the iris, or sclerotic ; and when the iris becomes sensibly affected, the change in its color, and loss of brilliancy of its surface, are not in proportion to the loss of power in the retina ; and amaurosis is often nearly complete, before any increased action is apparent in the

sclerotic, and the vascular zone round the cornea is dull and faint.

In iritis, change in color of the iris, and loss of brilliancy of its surface, and even tubercular deposit of fibrin, often precede the diminution or loss of vision ; and also an extensive injection of the vessels of the sclerotic, around the margin of the cornea, and a considerable degree of conjunctivitis, may exist with iritis, and yet the vision be little disturbed. It must be remembered, however, that iritis cannot well, and rarely does exist for many days, and sometimes, not many hours, without the choroid becoming affected ; and, as soon as this takes place, vision becomes impaired. If the disturbance of vision precede the inflammatory symptoms in the iris, the disease has commenced in the choroid : but when change in the iris takes place before amaurotic symptoms occur, the iritis is primary, and the choroiditis secondary.

Before the iris participates in the disease originating in the choroid, the symptoms I have pointed out must, I conceive, render the diagnosis easy ; but, as soon as the iris and sclerotic, &c., become implicated, the origin of the disease, or its primary seat, can only be detected by a careful examination and enquiry into the history of the case.

It must be borne in mind, that the commence- Treatment.

ment of this disease is usually very insidious, not being productive of any suffering, but merely occasioning a partial or general confusion of vision of trifling degree; which, if neglected, inevitably leads to more serious mischief, usually by a slow process, but not unfrequently, by a more acute and rapid action: whenever, therefore, a patient complains of a continued mist or gauze, combined with the appearance of muscæ, and the other symptoms which I have described as denoting the effects of the commencement of inflammatory action in the choroid, he should be advised to rest the organs as much as possible, to pursue a regular plan of diet, and to attend to the condition of the secretions; besides which, he should be submitted to an alterative plan of treatment; and in case of sense of fulness or uneasiness about the eyes or forehead, counter-irritation should be resorted to. The medicinal and dietetic treatment must depend upon the condition of the constitutional power of the party affected; most frequently, as I have stated, the disease occurs in persons having a scrofulous diathesis, and therefore, generally weak power.

Of the number of cases of this disease, which have come under my observation, I am certain that, in nineteen out of twenty, it has occurred when the general power has been below par. Supposing, therefore, that such be the condition

of the patient, the diet should be good and nutritious; he should take small doses of mercury with chalk, or very minute doses of the bichloride of mercury, or, in some instances, Plummer's pill; but, in addition to either form of mercury, some tonic should be given; the form of which must depend upon the peculiarity of the constitutional disturbance, or the influence of any particular functional derangement. Thus, in some instances, sarsaparilla or bark may be proper; in other cases, the addition of mineral acid may be serviceable, as when the cutaneous action is inordinate; or, further, some preparation of steel may be employed with advantage, as in the case of the young female suffering from irregularity of uterine function, &c., &c.

Sometimes cases occur, in which the disturbance of general health has been principally produced and maintained, by causes which tend to exhaust, too rapidly, the general power; such as excess of application to a sedentary employment, with deficient rest, or prolonged lactation in the delicate female, or excess in venereal gratification, or onanism.

An unusual degree of debility, without derangement of any important function, generally characterizes such cases. The importance of distinguishing them, must be obvious; as without

a removal of the exhausting cause, there can be little chance of reinstating the general power.

I shall, presently, detail some cases which will illustrate many of these points.

If the disease have proceeded so far as to implicate the iris, and involve it in the inflammatory action, and, at the same time, to produce such disturbance of vision as prevents the patient from recognizing ordinary objects, the use of mercury should be more free, and such as to induce a marked influence on the system ; yet, at the same time, the strength must be promoted and maintained, by good diet, and by medicinal tonic remedies. Should the pupil be more contracted than usual, or irregular from partial adhesion of its margin to the anterior capsule of the lens, belladonna should be employed, daily, to the affected organ. Thus, the principle of treatment consists in promoting and maintaining a proper degree of constitutional power, by withdrawing the causes of exhaustion, by correcting error in important functions, by the use of a generous diet, and by the administration of tonic remedies ; and, at the same time, in checking the local morbid action, by the alterative influence of mercury or iodine, and the aid of counter-irritation.

Sometimes the disease occurs when the con-

dition of the vascular system is too full, and, under such circumstances, symptoms are usually more decided in their origin, more rapid in their progress, and attended with more local distress. The aspect of the patient, and the state of the pulse, can hardly fail to indicate to the medical man this state of plethora; and his endeavour should then be, to reduce the fulness of the vascular system, by a moderate abstraction of blood, by a spare diet, by a free action upon the mucous and cutaneous surfaces, and by quietude; and, as soon as he has brought the action of the heart and arteries to the proper level, he should commence the alterative or mercurial treatment, and be careful not to continue the depletory treatment, so as to reduce the general power below its ordinary standard; otherwise, the alterative or mercurial will fail to produce the desired effect.

Should the disease assume an acute character, as indicated by the symptoms which I have before described, abstraction of blood, generally, may be required; but it should always be taken away in moderation, only in sufficient quantity to diminish tension of the arterial system, should it exist; or, locally, to relieve congestion of the affected organ, without influencing the general circulation.

When decided inflammatory action, therefore,

occurs, the treatment must be active, in proportion to the urgency of the local symptoms, and to the power of the patient. I have observed, that the disease principally attacks those of naturally feeble constitution. If, then, depletion be requisite, the patient should be most carefully watched, during its continuance ; so that it may not be carried beyond the extent required to check acute symptoms, nor produce unnecessary exhaustion. In many cases, when the disease is apparently acute, but the power feeble, the loss of blood aggravates, rather than benefits, the affection. I have known the continuance of depletory treatment prove most injurious in augmenting morbid action, and hastening the disorganizing process ; especially in young and delicate persons.

Unfortunately, as relief from pain frequently follows the local abstraction of blood, the patient is desirous of resorting to such treatment again, upon every fresh attack, or relapse ; and the medical attendant, often unacquainted with its injurious effects, readily adopts it. The relief is, however, of short duration ; another burst of acute symptoms soon occurs ; the same remedies are again resorted to, with similar effect, by which the patient is further reduced in power, and the local disease makes further progress in disorganization. Under continuance of the treat-

ment, the patient suffers from repeated attacks of acute kind, each of which produces an increase in the amaurosis, and, eventually, vision is completely destroyed ; and, at the same time, the general health is materially deranged, if not permanently injured.

I have seen several very distressing cases of permanent amaurosis, resulting from such treatment; and I have also known many instances, in which the disease has been arrested, and vision preserved, by raising and maintaining the general power, and pursuing the treatment which I have recommended, after many weeks of depletion had failed to check the morbid action.

64. A single lady, aged twenty-nine, of a spare Case. and delicate make, consulted me in consequence of imperfection of vision of the left eye ; she had been troubled, first, with the appearance of a dark spot of evanescent character, which had been followed by a general mistiness of sight. She complained of a sense of fulness, and occasional tenderness of the globe. On examining the organ, I found the iris rather dull in its aspect, the pupil larger than natural, and the motions of the iris sluggish, but the conjunctiva and sclerotic without any evidence of increased action : her general power was below par, but I could not detect any error in the principal functions. I directed her to take plain good diet, without

any vegetable acids ; I prescribed some compound colocynth extract with henbane, for an occasional aperient ; ounce doses of the compound steel mixture, twice a day, and one grain of mercury with chalk, with three grains of prepared chalk, every other night. I desired, further, that she would apply a small blister above the eyebrow ; and, afterwards, to allow the part to heal quickly under the application of a simple ointment ; then again to repeat the blister, after the part had become sound, if the sensation of tension or uneasiness in the globe remained. She followed this plan, (keeping the organs quiet,) for nearly a month, without experiencing any improvement in vision ; though the sense of tension in the globe had, in great measure, subsided, after the application of three blisters : her general health had improved, when I requested that the mercurial should be taken every night, instead of every other night. In a few days, the gums became slightly tumid and tender, but without any distress, or discharge of saliva ; and, at the same time, the density of the mist diminished. I ordered the use of the mercury to be less frequent, but that she should otherwise persevere in the treatment. By degrees, the vision improved, and, in about two months, it was perfect ; and the medicines were gradually laid aside. I urged her, however, to be careful in

her diet, and, especially, not to use the eyes for minute purposes, for long together.

This lady has since had several slight relapses; but each has been caused by some derangement of the general health, or imprudence in the use of the eyes. With one exception, relief has been obtained in a few days, by quiet, and attention to the secretions and to the diet; but, on one occasion, she was obliged to take the small doses of mercury for two or three weeks, before the affection subsided. She has now remained many months without recurrence of the disease; and her health has been materially improved, by a few months residence in the country. I consider this to have been a pure case of choroiditis.

65. A female, between thirty and forty years Case. of age, married, and the mother of several children, was brought to the Ophthalmic Hospital, in consequence of disease of the eyes, which had destroyed all useful vision. The disease had commenced in the right eye with *muscæ*, and impaired vision; and had proceeded to the development of inflammation in the choroid; under a continuation of which, the vision had been gradually destroyed. Before the right eye had become quite amaurotic, diseased action had commenced in the left, as it had previously done in the right; and had gone on to affect vision, so that she retained little more than the perception

of light. The right globe was excessively tense, and a staphylomatous projection of the sclerotic existed at the upper and outer part, near to the cornea ; the iris was dull and discolored ; the pupil small and irregular, and occupied by opaque matter, to which the pupillary margin was adherent. The left eye was also more tense than is natural, but without alteration of figure ; the iris was likewise dull and discolored, but not so much so, as that of the right eye ; the pupil was a little contracted and irregular, its margin being adherent, in part, to the anterior capsule of the lens ; and the capsule was slightly opaque, near to the points of adhesion ; the general health of the patient was very indifferent, without there being any material derangement of important function—her appetite was bad, her rest disturbed, and she complained of a feeling of depression. I found, that the general and local disturbance had existed only a few months ; during which time, she had been submitted to much mental distress and annoyance : previous to this, she had enjoyed good health, and she did not evince any strumous diathesis. I directed that she should have good diet, and be kept, as far as possible, quiet in body and mind : (fortunately, the principal cause of mental anxiety had ceased.) I prescribed a twentieth of a grain of the bichloride of mercury in decoction of sar-

saparilla, thrice a day ; and a mild dose of compound decoction of aloes with sulphate of magnesia, about twice a week. I began with very small doses of mercury, being fearful of too powerful an action of the remedy, in her depressed and enfeebled state. I was soon enabled, however, to increase the dose ; for her general health rapidly improved. A few weeks elapsed, before any decided improvement took place, as regarded the eyes, when she began to distinguish large objects with the left, and the tension of the right lessened ; by degrees, the dose of the bichloride was augmented to one-eighth of a grain, three times a day. This dose occasioned slight tenderness of the mouth, when it was again lessened ; because the patient was proceeding favorably, both as regarded her health and eyes. Within six months from the time I first saw her, she had recovered good vision of the left eye ; being able to read a print of moderate size, and to use her needle readily. The staphylomatous projection had quite subsided in the right eye, leaving the sclerotic coat thin and slightly flaccid, at the part where the staphyloma had existed : and she had a distinct perception of light with this eye. The irides nearly recovered their natural color and brilliancy ; but both pupils remained irregular, and the opaque matter in that of the right appeared unchanged. Above three

years have transpired, since she underwent this treatment ; and she has not had any relapse, which has required a renewal of treatment.

Case.

66. A gentleman, about thirty years of age, of a fair complexion, and scrofulous diathesis, came to consult me, in consequence of a severe degree of inflammation affecting his eyes, from which he had suffered for several weeks ; and for which he had been severely treated, by depletion, abstinence, mercury, &c. ; but he had obtained no further benefit than a mitigation of acute symptoms : he was much depressed, he was pallid, circulation was quick but very feeble ; his extremities were cold ; both eyes were affected ; but the disease had originated in one, and the other had become inflamed, whilst he was under treatment. The eye first attacked, exhibited a dull and discolored iris, with an irregular pupil, from adhesions between the iris and capsule of the lens : and numerous vessels in the sclerotic and conjunctiva distended with red blood of a dark and dull color ; he could merely distinguish light with this eye ; in the other eye there was also some injection of the vessels of the sclerotic and conjunctiva with red blood, but in a minor degree ; the iris was dull and slightly discolored, but the pupil retained its circular figure, and the membrane retained considerable power of motion ; the vision, however, was very imperfect,

objects appearing as if viewed through a gauze ; besides which, several dark muscæ were observed floating before the eye, when it was directed towards a light ground ; the patient was under the influence of mercury, his gums being tender, and his breath offensive : I advised him to adopt measures to improve his general health, and, at the same time, to lay aside the free use of mercury.

By partaking of a good nutritious diet, by the use of a moderate quantity of wine and sarsaparilla, his strength rapidly improved, and the marked influence of mercury gradually subsided, although he continued to take this remedy, in the small dose of one grain of the mercury with chalk, each night. The local disease subsided as the general health improved, and, in a few weeks, the eyes were free from inflammatory action ; that which had been least affected recovered a perfectly healthy appearance, but the vision of it remained slightly obscure : in the other, the pupil remained irregular, and although there was very slight and partial opacity of the capsule of the lens, the vision was very imperfect ; so much so, that he could not discern large objects, unless in a favorable position as regarded the incidence of light. This condition of vision remained after his general health appeared perfectly re-established ; and I became

fearful that, under the continuation of diseased action, a deposition had taken place, which had become organized; and that, consequently, permanent pressure upon the retina was established; but I did not like to abandon the case without a trial of further means; and, having had experience in this patient, of the depressing effects of mercury, used freely, I preferred the employment of iodine, with the hydriodate of potash and sarsaparilla. This I prescribed in the following proportions,—one-sixteenth of a grain of iodine, and four grains of hydriodate of potash in one ounce of decoction of sarsaparilla, to be taken thrice a day. The effect of this remedy was most beneficial; for, after taking it for a few weeks, his vision became perfect in one eye, and nearly so, in the other; a slight partial haze only remaining, with one or two small dark *muscæ*.

I have since, in several instances, given the iodine when I have considered that the alterative mercurial treatment has produced its full effect; and have good reason to speak highly of the remedy.

This case shews that mercury will not act beneficially, unless used carefully, and with due attention to the state of the general health; and further, that there is another good and powerful remedy, when mercury cannot be employed without risk.

67. A gentleman, about fifty years of age, ac- Case.
tively engaged in the practice of surgery, in a large provincial town, and of high and deserved reputation in the profession, became rather suddenly distressed, from the appearance of some large spots, which floated before the eye, or seemed as stains upon an object regarded, being more distinct in proportion to the light color or brilliancy of the object looked at, and becoming very faint, or disappearing altogether, when the eye was directed to a dark or black ground. These spots, after a short time, remained constant and invariable; he did not, however, experience any other inconvenience than a sense of fulness; but, having had considerable experience in ophthalmic practice, he became alarmed when he found that little or no change was effected after taking some active aperients, and lessening his diet for some days. He then came to town, to consult a medical friend of the highest experience in such diseases; and, being with his friend at the time of his visit, I was requested to assist in a consultation on the case. His friend, I believe, considered the disease to be principally congestive, and expressed his opinion that abstinence, rest of the organs, and a free action on the more important secretions, would probably restore the healthy condition of the eye, in a short time. I considered that, probably, some deposition had taken place from a slow inflammatory action; and

I came to this opinion upon learning that the spots were constant and little variable ; although no evidence of increased action could be detected upon a careful examination of the eye. The iris was brilliant, the pupil round, and the motions of the membrane as active as in the sound eye. The patient had, some years previously, presented an unhealthy aspect ; being thin, pale, and apparently, very delicate ; but, at the period of the origin of the disease under consideration, he had become stout and florid, and had the look of a plethoric person. This great change in appearance, perhaps, induced the friend whose opinion he sought, to consider the affection as the result of local congestion.

The gentleman returned to the country, and attended to the advice given by his friend, as far as regarded the use of a spare diet, and the taking of medicines, to produce a free action from the liver, bowels, &c. : but he continued to use the eyes to a much greater extent than had been advised, and to pursue, as formerly, his professional avocations. He was in the habit of reading in his carriage, whilst on his daily rounds ; and some weeks after his return from London, he was suddenly seized, whilst in the act of reading, with pain of a severe kind in the eye, and a general disturbance of vision. The pain, by degrees, augmented and became acute, whilst the mistiness of vision increased, so as

quickly to destroy all but perception of light. He now had recourse to abstraction of blood, and a free use of mercury ; at the same time, continuing his previous plan of a spare diet and active purging. The most acute symptoms were by these means mitigated ; but he became depressed and irritable ; and the organ continued inflamed, for he still experienced pain ; numerous vessels of the conjunctiva and sclerotic were injected with red blood, and the vision remained almost wholly obscured. He was soon compelled to abandon his professional pursuits, and again came to town, to seek the advice of those whom he considered most experienced in ophthalmic medicine ; and he had the advantage of the opinions of nearly all who had attained eminence in this department, with most of whom he was intimately acquainted ; and under their sanction he continued to use depletion, abstinence, and mercury, remaining, at the same time, perfectly quiet, and keeping the secretion from the bowels free.

Under this treatment he became greatly reduced in general strength, and he continued to suffer from repeated attacks, of acute kind, in the affected organ. These were subdued by the application of leeches, or the use of the cupping-glass, but no permanent good effect was produced by the local or general treatment. After a

few weeks his health became so much impaired, that he was compelled to use a more nutritious diet, and he also took sarsaparilla. He quitted the metropolis, and went to the southern part of the coast, that he might have the additional advantage of a good air. The use of mercury was much diminished at this period, but the local depletion was continued, when symptoms of acute action occurred. His general health improved during the period of a few weeks that he remained at the sea side ; but little, or no change took place in the ocular affection. On his return to town, he sent to me, requesting me to call upon him, which I did in the course of the day. I had not seen him since his first visit to London, when he complained only of the large muscæ or spots; but I now obtained from him particulars, of which I have given a general statement. I found him very much reduced in bulk and strength; he was pallid, and had an anxious look; his pulse was quick, but feeble and irritable; the appetite was indifferent; the secretions had been kept free by medicine. The eye presented a dull and discolored iris, with an irregular and rather contracted pupil, from adhesion of the pupillary margin of the membrane, to the capsule of the lens; vessels filled with red blood of a dark hue were apparent, though not very numerous, both in the conjunctiva and sclerotic,

he continued, however, to suffer from attacks of severe pain and increased redness of the organ, every five or six days, and, occasionally, had longer intervals of relief. I strongly advised him to take a nutritious and generous diet, with a moderate quantity of the stimulus he was accustomed to ; to keep up about the ordinary degree of secretion from the bowels, &c. ; to take minute doses of mercury, and a light medicinal tonic, as sarsaparilla, cusparia, &c. After a day or two of consideration, he determined to try the plan I proposed ; he, therefore, laid aside the active aperients and local depletion, and took a good diet with a little wine, and, occasionally, a mild aperient ; and commenced with mercury with chalk, in doses of one grain, each night, and the decoction of sarsaparilla thrice a day ; but after a few days he substituted a solution of the bichloride of mercury, in dose of about one-twentieth of a grain, which he took thrice a day with the sarsaparilla, instead of the mercury with chalk. He soon experienced the beneficial influence of this plan of treatment, as he had no relapse of acute kind, which was of any importance ; but his general health improved, and the aspect of the organ gradually became more healthy ; the red vessels, by degrees, disappeared from the sclerotic and conjunctiva ; the iris became more brilliant, and lost much of its greenish hue : from

having little more than perception of light, he gradually acquired vision, so as first to be able to distinguish the windows of the room, and next to discern the division of the window frames ; soon afterwards he obtained a view of a small balcony outside the window ; and, after a short period further, he was able to distinguish the opposite houses, and carriages, and persons, &c., passing through the street : in fact, his improvement, though slow, was uninterrupted and most satisfactory ; so far as regarded the subsidence of all morbid action, and the restoration of a very useful degree of vision.

Some slight modifications were, perhaps, made in the treatment during its continuance ; but the principle I pointed out was followed up, namely, the promotion and maintenance of a proper degree of general power, and the steady use of mercury, as an alterative. The gentleman returned to the country before he had completed the treatment, so that I had not an opportunity of seeing the condition of the organ, or knowing what extent of vision was regained.

The case is altogether one of much interest and value, as proving that depletion and mercury are inadequate to arrest local inflammation ; and that mercury will, under one condition of system, act injuriously, producing depression and irritability ; and that its effects are most salutary, when

administered with care, whilst a proper degree of general power is maintained.

68. A man, aged thirty-three, of delicate and Case. spare habit, by trade a painter, received an injury in the eye, from a piece of glass, in November, 1837 : this was followed by pain and inflammation, which induced him, after a few days, to consult an oculist ; but, at the time, he could see to read a small print easily, with the injured eye : he was submitted to severe depletory treatment, being cupped, having leeches applied, taking active aperient medicines, and refraining from solid animal food, and all stimuli : at the expiration of two months, under this treatment, he was so reduced, that he could hardly stand, and he had lost all useful vision of both eyes : he then obtained admission into one of the large hospitals, still suffering from inflammation of the eyes, and severe ocular and circum-orbital pains ; here he was again cupped and blistered, was kept upon very moderate diet, and took Plummer's pill and bark combined with soda ; but as no improvement took place, and his general health was seriously enfeebled, he was allowed a more generous diet, and depletory remedies were abandoned : he then made some progress in recovering strength, and considerable mitigation of the ocular affection took place ; and he left the hospital after seven weeks residence there, better

than when admitted—being still, however, a sufferer from inflammation of the eyes with pain : he then applied to another oculist, under whose care he continued for seven weeks more, following very much the same plan of treatment as that he had been previously submitted to : he obtained no benefit during this period, and experienced a sudden severe relapse, from the influence of cold, which compelled him to give up his attendance. He then remained some short time without medical assistance ; but afterwards he was induced to apply at the Ophthalmic Institution : when I first saw him, he was emaciated, pale, and desponding ; his pulse was small, quick, and very feeble ; his appetite was bad, and his secretions irregular ; his sleep was restless, and easily disturbed ; the left eye exhibited a scar from the injury, extending upon the sclerotic and cornea, to the outer and lower edge of their junction ; a few vessels of the conjunctiva, and many of the sclerotic around the cornea, were injected with red blood ; the iris was dull, and very much discolored ; the pupil was contracted, irregular, and filled with opake matter ; he could distinguish a bright light with this eye, but was much troubled with sparks and flashings of light, when in the dark : the right eye exhibited a nearly similar condition of conjunctiva, sclerotic, and iris ; but the pupil was not so much

contracted as that of the left, and was occupied by matter less opaque, than that which filled the left pupil: he had a more distinct perception of light with this eye, but the light appeared to him to have a deep tinge of orange color: several dark muscæ appeared before this eye, when it was exposed to the light; but he had not any appearance of sparks or flashes in it.

I directed the patient to take a good plain diet and some porter, and I prescribed half a grain of mercury with chalk, with half a grain of hydrochlorate of morphia, every night, and a mild dose of compound decoction of aloes, with tartrate of potash, every other morning; and, after a few days, when his general irritability was in some measure relieved, and the secretions improved, I prescribed, further, some compound decoction of sarsaparilla: within two or three weeks after commencing this treatment he became free from pain, his rest became sound and uninterrupted, so that I withdrew the use of the morphia; his general health gradually improved, and the eyes became free from symptoms of inflammation: he continued the plan, uninterruptedly, for about six months, when I modified the treatment a little, finding that the improvement was stationary; I, therefore, gave him the bichloride of mercury, in doses of one-twentieth of a grain, with the sarsaparilla, and omitted the mercury with

chalk. I also directed that he should rub a small quantity of a weak ointment of iodine with hydriodate of potash, to the forehead, every night: for a short time, some slight further improvement took place, when he again seemed to be at a stand still, and I again modified the treatment; thus he has gone on up to the present time, with occasional alterations in his medicines, but with adherence to the same principle throughout—viz., of improving the general health, and keeping up the influence of a mild alterative course: occasionally, it has been requisite to change the form of mercurial, as well as of tonic; he has taken iodine and steel, besides the tonics previously mentioned, and the Plummer's pill has been sometimes varied with the mercury and chalk, and the bichloride. At this period, January, 1840, his general health is hardly fully re-established: but the eyes are free from all evidence of present diseased action, and he has distinct perception of light with both, but in much the greater degree with the right: he has, for some months, lost all appearance of sparks and flashes, and there is no longer any orange tinge in the light, but it appears white and natural. I hope, by the ensuing spring, to have re-established his health, so that I may be able to commence the operation of drilling, with the best prospect of success.

I believe that the active depletion in the early treatment of this case, was the principal cause of the increase of the local mischief and of its extension to the second eye, and that both organs would have been disorganized had such treatment been continued.

69. A young man, aged twenty-eight, of dark complexion, but slender make, and by trade a watchmaker, applied at the Ophthalmic Hospital in consequence of imperfect vision in one eye ; that, with which he had been in the habit of using a high magnifying power. The affection had commenced as impaired vision, a gauze appearing after much exertion of the organs, and this gradually increasing and appearing from shorter application of vision, until a permanent mist was established : he complained, also, of the presence of numerous dark *muscæ*. On his application at the institution, he could see minute objects distinctly with one eye, for a short period ; but, after regarding them for a few minutes, a slight mistiness, in a degree, obscured the object :—with the other eye all objects were indistinct ; he had a sense of fulness in the eyeball, especially after any exertion of vision, and some uneasiness in the forehead ; the eye, least affected, did not present any morbid appearance, but the other exhibited a dull condition of the iris, with the pupillary aperture more contracted than

that of the other organ, and the motions of the membrane were comparatively slow;—but there was no other evidence of disease. The general health of the patient was indifferent, his pulse was feeble, and his aspect evinced want of power. I desired him to refrain from work altogether, for a short period, and to take a plain nutritious diet; and prescribed five grains of Plummer's pill, every other night; an occasional aperient, and half a drachm of carbonate of iron, thrice a day. I gave him the small dose of mercury, because I considered that the aspect of the iris indicated chronic inflammatory action. After the expiration of three weeks, he was enabled, partially, to resume his employment; working for short periods, and allowing moderate intervals of rest to the eyes. By degrees, as his general health improved, the time allotted for work was gradually increased, without inconvenience or relapse; and, by steady perseverance in the plan of treatment, his vision was perfectly restored, in both eyes, after about three months' attendance at the hospital.

He remained perfectly well for nearly two years, when he had a severe attack of influenza; which caused derangement of health, and much prostration of strength. On his resuming his employment, which he had been compelled, for a short time, to abandon, he soon became sub-

ject to the disturbance of vision, of a temporary kind ; and, being compelled, from his circumstances, to continue his occupation, the temporary disturbance of vision rapidly augmented, and became permanent : at the same time, more decided symptoms of inflammation presented themselves ; the organs becoming red and painful, with a sense of tension and tenderness. Both eyes were affected, but not in equal degree ; the diseased action being greater, and producing more serious mischief in the eye in which he had, formerly, had the most serious attack : being incapacitated, through loss of vision, from following his employment, he became very much distressed, and unable to procure sufficient attention and nutriment. The disease in the eyes continuing to augment, he at length made application again at the Ophthalmic Hospital for relief : finding him in a very bad condition of general health, with one eye disorganized, and the other in a very critical state, I advised him to become a patient in St. Thomas's Hospital, under my care, which he immediately consented to. On examining him more attentively, after his admission into the hospital, I found that he evinced symptoms of serious cerebral mischief, besides the disease in the eyes ; and that this cerebral disease required more immediate attention. Under a mild alterative treatment and

counter-irritation to the neck, &c., he appeared, for two or three weeks, to be improving; and the inflammatory affection of the eyes greatly subsided; suddenly, however, the cerebral disturbance was greatly augmented, and he sunk rapidly.

I had an opportunity of examining the eyes, within a few hours after his decease; and found in the left eye, which had become soft, that the choroid coat was greatly deprived of its pigment, being of a pale fawn color; that its inner surface, or the membrane which invests it, was covered by a thin deposit of fibrin; but this deposit was unequal, being very decided in some parts, and little apparent in others: the texture of the choroid membrane itself was much changed, for it gave way to a very slight degree of force, as if it had been partially decomposed by maceration: within the choroid, and external to the retina, was a considerable collection of serous fluid of a dirty yellow color; the albuminous character of this fluid was shewn, by a partial coagulation, when mixed with spirit: the retina had been pressed inwards, a considerable portion of the vitreous fluid having been absorbed; the texture of the retina was greatly changed; the outer layer, or *membrana Jacobi*, was irregularly covered by deposit of fibrin, as I have described the inner membrane of the choroid to have been; and the irregularities of de-

posit upon the two surfaces corresponded, as if some adhesion had existed between the two, before the effusion of serum took place; the retina was much thickened, opaque, and resisting, so that it required more force to rupture it, than to tear the choroid; it had become folded in numerous parts, somewhat as the mucous membrane of a partially emptied stomach; the rugæ, or folds, however, had all a direction from behind to before, being most evident near to the optic nerve, or posterior attachment. The iris was much thickened, was adherent to the anterior capsule of the crystalline lens, and the coloring matter or pigment was very deficient; the texture of the membrane was soft, as that of the choroid. The hyaloid membrane was not altered in texture, but the vitreous fluid was scanty, slightly discolored, and about the consistence of the serous fluid which had been effused between the choroid and retina. The crystalline lens was opaque. In the other eye, which had retained its ordinary fulness and elasticity, the choroid coat exhibited a change, very similar to that which I have already described as existing in the eye first examined; being of a light brown color, and easily torn;—it was, to a large extent, adherent to the retina, by a deposit of fibrin; and, on endeavouring to separate some of these adhesions, the choroid readily gave way; the retina was slightly

thickened, especially in those parts where the principal adhesions existed ; but it had not undergone a change at all corresponding to that found in the retina of the other eye : there was not any effusion of serum, between the two tunics ; the iris was partly adherent to the anterior capsule of the lens, and the capsule partially opaque ; the texture of the iris was not much changed, and its pigment existed in tolerable abundance : the quantity of pigment, connected with the choroid coat, was also much greater than in the other eye : the hyaloid membrane, the vitreous fluid, and other humors, did not exhibit any morbid alteration ; the patient had been able to distinguish large objects with this eye, a few days previous to his death ; but his state of insensibility, sometime before his decease, prevented me from ascertaining if the visual power continued during life.

This was the first, and indeed the only case, in which an opportunity was afforded me of ascertaining the condition of the eye, sufficiently soon after death, to form a correct estimate of the changes induced by diseased action ; it was extremely gratifying to me to find, that the opinions which I had formed, as to the seat and progress of the disease, were corroborated by the examination of the organs themselves ; the eye which had been least affected shewed change,

principally, in the choroid coat, and in the serous membrane, between it and the retina; and, in this eye, the patient had experienced *muscæ*, and the vision had become obscured by a gauze-like mist: in the other eye, in which I found disorganization of the choroid and retina, principally, with absorption of vitreous fluid, the patient had experienced, at first, *muscæ* with a gauzy state of vision; subsequently, he suffered from the appearance of sparks and flashings of light, with increased local pains, and had eventually become amaurotic. The former symptoms, I believe, resulted from affection of the choroid alone; and the latter were consequent upon diseased action of the retina.

The chronic form of the disease often proceeds in such an insidious manner, that amaurosis may be produced in one eye, without the patient being conscious of any thing more than the *muscæ* or spots, which usually occur in the early part of the affection—this, however, happens very rarely; more frequently, the disease is allowed to proceed till it has produced extensive mischief, in consequence of there being little or no suffering;—a similar insidious form of the disease, sometimes, goes on after the acute stage has been arrested, but when the morbid action has not been perfectly subdued.

Before amaurosis becomes perfect, the greater

number of these cases can be remedied, or much benefited, by a steady perseverance in a mild mercurial course, with attention to diet, to the condition of the secretions, and rest of the organ. Now and then it is necessary to produce considerable mercurial action, and maintain it, for some time. These remarks are applicable, not only to those cases in which the pupil remains clear, but even to those in which the capsule of the lens has become opaque, or covered by an opaque deposit, and adheres to the pupillary margin of the iris, supposing that the patient retain perception of light, and the globe possess its usual firmness, elasticity and figure: for the medical treatment prepares the case for subsequent treatment by operation, the eye being much less disposed to inflammation, after a mercurial course: whereas, without it, an operation is more likely to excite a fresh morbid action, which will defeat its object.

When the disease has produced a complete state of amaurosis, so that the perception of light is destroyed, the case is not entirely hopeless, unless the globe be hard and the sclerotic has given way; or when, on the contrary, it has become soft and somewhat diminished in size. If, in fact, the globe possess its natural firmness and elasticity, and the pupil be clear or partly so, I consider it worth while to give a fair trial

to mercurial treatment, provided that the age and power of the patient admit of its adoption, without risk.

Cases of complete amaurosis, from choroiditis, are very rare, without such evidence of disorganization as would forbid even mild, much more severe treatment. I have seen a few cases, in which great benefit has been attained by the plan of treatment that I have recommended, and although it has failed, in some instances, the success of it in many cases, has been such as to warrant its recommendation.

70. One of the first cases of this kind, that Case. came under my care, was in a powerful man, about thirty-eight years of age, from the North of Ireland, who was sent to me by my late excellent friend, Dr. Babington: the patient had been amaurotic for seven years, and had lost the perception of light; but the eyes possessed their natural firmness and elasticity;—the pupils were clear, but irregular, from many points of adhesion between the pupillary margin of the iris, and the anterior capsule of the lens; the irides were discolored and dull; and he had the vacant aspect of a blind person. I admitted him into the hospital, (then in Charter-house square,) and put him under mercurial treatment, with a nutritious diet. As soon as his mouth became

tender, a considerable degree of sclerotitis occurred, with pain and tenderness of the eyeballs; the plan was, however, steadily continued, and belladonna was applied, night and morning, to the eyebrows. The man soon became sensible of light, and gradually acquired the power of discerning surrounding objects; at the same time, the adhesions between the irides and capsules of the lenses began to give way; and the pupils to re-assume their circular figures; by degrees, the vision improved; all appearance of inflammatory action subsided; the pupils became nearly regular; and the irides brilliant, and of proper color: eventually, the amaurosis was completely subdued, and his vision was perfect. A free mercurial action had been kept up for sixteen weeks; during which, he discharged about a pint and a half of saliva, daily; but, in spite of this severe treatment, the patient, at its termination, was improved in appearance, and increased in bulk.

In one other case, I have known a perfect recovery from amaurosis, under similar treatment. The disease, however, had been of much shorter duration, and the mercurial course occupied little more than twelve weeks. In a few other instances, a useful degree of vision has been obtained.

When the patient retains the perception of light, or of large objects, the prospect of recovery, from the treatment recommended, is much greater, than in the cases of complete amaurosis.

OF HYDROPTHALMIA.

Synonyme. **HYDROPS oculi.**

Symptoms. Usually, the patient experiences, at first, a disturbance of vision from muscæ, or from a gauze or mist which is evanescent; in fact, the symptoms which I have described as indicating congestion or chronic inflammation of the choroid: there is, however, after a short time, a greater sense of tension or fulness of the globe, with a dull aching pain, and slight tenderness of the eyeball: by degrees, these symptoms increase, the vision becomes gradually more obscured, and eventually, destroyed.

Appearances. Until the vision is permanently affected, the appearances coincide very much with those which I have described in the early stage of choroiditis; the iris becoming slightly dull, and the pupil being usually rather dilated, and the motions of the membrane very sluggish; but after some time, the sclerotic, around the cornea, becomes of a grey or light blue color, and an evident enlargement of the globe perceptible,

which, if not checked, gradually increases, so as to cause considerable projection of the globe : most frequently, there appears to be an increased secretion of aqueous fluid, at the same time ; for the cornea extends and projects in proportion as the sclerotic gives way ; now and then, however, the enlargement takes place, solely by a distension of the sclerotic, and the cornea remains unchanged ; the globe feels hard and inelastic.

I am not aware of any direct cause of this Causes. complaint ; but the predisposing cause is scrofula.

It occurs at a young period of life, usually, Persons under or about the time of puberty ; sometimes liable to. rather later in life—and is more prevalent among females, than males. I have known a few instances of two children, in the same family, being afflicted with this disease ; and, in one family consisting of five or six children, all were more or less subject to this affection.

The same plan of promoting and maintaining Treatment. general power, with the addition of a mild alterative and tonic course, such as I have recommended for chronic choroiditis with feeble power, is best suited to these cases, and I have succeeded, in several instances, in arresting the disease, and preserving useful vision, by such means. When the affection occurs about the

age of puberty, in the female, or shortly after, the uterine function should be carefully attended to, as any irregular action of it materially influences the ocular disease.

Case.

71. During the last year, (1839,) a young woman was in attendance at St. Thomas's Hospital, in whom this disease had commenced; her vision was imperfect, being obscured as if by a gauze; the eyeballs being very tense and inelastic, with a slight degree of tenderness; the irides being dull, the pupils rather dilated, and the motions of the irides very sluggish; the sclerotic, around each cornea, appeared slightly thinned, having a light bluish tint; but there was very slight enlargement of the globes: she was treated on a nutritious principle, as regards diet, and on a mild tonic and alterative plan, as regards medicine; she took, principally, small doses of mercury with chalk, regulated so as not to produce soreness of mouth; and small quantities of steel, or some preparation of bark. She derived much advantage from the treatment, having recovered considerable power of vision. There was frequent interruption to recovery, principally from irregularity of uterine function, which became less frequent, as the general health improved.

I consider the principal site of this disease to be in the serous membrane, between the choroid

and retina, from which an inordinate secretion takes place, occasioning pressure which affects the functions of the retina, and occasions a yielding and distension of the sclerotic ; and, further, that the other serous membrane of the globe, namely, the aqueous membrane, takes on a similar action, at the same time.

I have tried the effect of evacuating the aqueous humor, in a few of these cases ; but have not found any advantage from it, although I have continued it for many days, without interruption.

My opinions, respecting the affections of the choroid tunic, have not been formed hastily ; but have resulted from careful and close observation of a very large number of cases. They were, first, clearly established just subsequent to the universally lamented death of her royal highness, the Princess Charlotte of Wales, when I had ample opportunity of witnessing and tracing the effects of congestion and inflammation in the choroid.

At the period above alluded to, all persons were anxious to evince their feelings of sorrow and respect, by assuming, as early as possible, the conventional garb of grief ; and, consequently, an unusual quantity of work devolved upon

those engaged in dress-making. It would answer no good purpose, to detail, here, the excessive cruelty, which mercenary considerations induced many of the dressmakers, &c., &c., to exercise over their dependents and apprentices; and which led to disturbance, diminution, or destruction, of vision, in many of those poor and delicate beings.

Of the great number of such patients, who came under my observation, at the London Ophthalmic Hospital, and elsewhere, in consequence of disturbance, or loss of sight, from the cause above mentioned, the majority were affected with *muscæ* in various degrees, or impaired vision; in others, symptoms of incipient organic change were manifest: some had marked inflammation in the choroid and iris, with much obscurity of vision; and, in a few, the eyes were destroyed as visual organs, by disorganization of the most delicate tunics and humors. The most severe and distressing cases commenced, as those which proved of little ultimate importance; viz., with *muscæ*, or impaired vision, or both, succeeded at various intervals by symptoms of inflammation of the choroid, in which the iris became soon implicated, and from which irregular condition of pupil, with synechia posterior, and opacity of the anterior capsule of the crystalline lens, in

various degrees resulted; and, subsequently, symptoms of inflammation of the retina were superadded; the globe became soft, and vision was entirely and irrecoverably destroyed. The more robust of these poor creatures suffered least, and the more delicate became amaurotic; and, generally, the amount of mischief was in proportion to the previous deviation from the state of health, and the debility of the system.

The commencement, progress, and termination, of choroid disease were thus placed before me, in their several stages; from the condition of simple and partial congestion, or simple functional disorder, as indicated by evanescent muscæ, or the state termed impaired vision, to the development of inflammation in the choroid and iris, evinced by changes in the condition of the vessels of the conjunctiva and sclerotic, and in the aspect of the iris and its pupil, with increased disturbance of vision of unvarying character; and, further, the extension of diseased action to the retina, vitreous body, &c., as marked by the aggravation of suffering, by the appearance of sparks, flashings, colors, &c.; by the rapid annihilation of all visual power, and by the shrinking and softening of the eyeball.

The facts, thus offered, were too striking and numerous to leave a doubt on my mind, as to the seat and character of the disease; but,

had a doubt remained, it would long ere this have been cleared away, by the very many cases, in which I have had opportunities, since, of confirming the opinions which I have expressed.

OF DEFICIENCY OF PIGMENT.

THERE often appears to be a deficiency of the coloring matter of the choroid in old persons ; it is indicated by diminution of color in the iris, and a want of brilliancy in the pupil ; or, rather, the pupil does not present the jet black character which is common in the healthy eye, but it has a light grey tinge, which is often mistaken for incipient cataract ; at least, patients have been brought to me, by medical men, on various occasions, under the supposition that cataractous disease existed ; but when only this grey appearance of the pupil could be detected. It is attended with a deficiency of visual power, and very brilliant light is offensive to the eye. The sight is not obscured by a mist or fog, as in the commencement of cataract ; but objects are not so distinct and well defined as usual. I have observed a similar appearance, in younger patients, after a continuance of chronic affection of the choroid, which has rendered the vision imperfect.

If the pupil be dilated by the influence of belladonna, it is easy to ascertain that the lens is perfect, and that the grey appearance results from reflection of light from the retina or choroid, which, under these circumstances, has a very slight silvery aspect. In the young subject, in whom the deficient secretion results from chronic inflammation of the membrane, the grey appearance sometimes subsides as the morbid action ceases, when the coloring matter of the choroid is again formed in proper quantity; but in the old subject, in whom the want of secretion depends upon a diminution of the vascular action of the part, science or art can do little to remedy the evil; some relief may, however, be afforded by protecting the eyes with a glass slightly stained with some dark tint, when the patient is exposed to a strong or brilliant light.

Some of the important diseases of the retina so soon extend to, and implicate, the vitreous body, that I deem it requisite to give the anatomy of the two structures, before describing the diseases; to render my explanation, of the mode of extension of morbid action, more easily understood.

A N A T O M Y

O F

T H E R E T I N A .

THE retina is considered as the third proper Derivation. tunic of the globe, and is named from its supposed web or net-like structure.

It extends from the termination of the optic nerve, with which it is continuous, as far forwards as the commencement of the ciliary folds or ciliary body ; being placed within the choroid, and external to the vitreous body.

The continuation or connection of the retina with the optic nerve is, principally, by means of the nervous or pulpy matter ; which, passing through the small apertures at the posterior and inner part of the sclerotic coat, (*foramen cribrosum*,) forms a small nipple-like projection, from which the retina spreads out on all sides : anteriorly, the retina presents a scalloped or fringed

margin, corresponding with, and adapted to the origin of the plicæ of the ciliary body ; but there is not any connection between the termination of the retina, and the folds of the choroid : externally, the convex surface is invested with a serous membrane, known as the *membrana Jacobi* ; and this is opposed to a similar membrane which lines the inner surface of the choroid : internally, the concave surface of the retina is adapted to the outer surface of the hyaloid membrane of the vitreous body, but without being adherent to, or connected with it.

The retina is composed of a serous membrane, (*membrana Jacobi*,) externally ; next to which, internally, is placed the nervous layer or pulp ; and this is supported by a very fine and delicate web-like structure, formed of blood vessels and cellular tissue, which separates the pulp from the vitreous body.

In the natural state, the structures composing the retina are perfectly transparent, allowing the coloring matter of the choroid to appear, which gives the dark aspect to the pupil ; but soon after the loss of vitality, the retina becomes opaque.

When carefully examined, by making a transverse section of the eye under water, so as to separate the globe into an anterior and posterior hemisphere, the retina is found to be uniform in

appearance, excepting at a very small part which extends from the site of the optic nerve, outwards, in the direction of the temple, to the axis of vision, where a fold of the membrane exists, having in its centre a minute dark spot, somewhat oval, slightly depressed, and with a yellow margin; this is the *foramen of Soëmmering*; strictly speaking, a double fold exists, or two minute plicæ, which unite at their extremities, leaving a little boat-like depression between them, in which the dark spot is situated; these folds, or plicæ, extend outwards from the optic nerve about a line and a half; and their greatest extent of separation is nearly a line.

The dark spot is not an opening in the retina, as Soëmmering supposed, but simply a depression, resulting from a deficiency of structure; there being a single layer only extending over this spot.

The organization of the retina is evinced, principally, in its internal part. The arteries are derived from the central artery; one or two vessels enter the globe with the optic nerve or pulp, and two principal branches are immediately given off, one of which passes above, and the other, below the optic opening; these vessels spread out, divide, and sub-divide, again and again, and form frequent anastomoses, so that a beautiful arterial network results, from which

the tunic has been named. From the arteries which reach the anterior termination of the retina, minute branches pass forward in the hyaloid membrane, to the circumference of the capsule of the crystalline lens.

The veins accompany the arteries, and return the blood to the vein which accompanies the central artery.

A nervous filament from the ganglionic system has, I believe, been traced, in the course of the central artery to the retina.

No absorbents have been yet detected in the retina.

The retina is destined to receive the impressions, which are conveyed by the optic nerve to the brain.

ANATOMY

OF

THE VITREOUS BODY.

So named from its glass-like appearance.

Derivation.

It consists of two parts,—a fluid, and a membrane which contains, and probably secretes, the fluid. It occupies about three-fourths of the interior of the globe, as formed by the retina, choroid, and iris, sclerotic and cornea, and is situated at the posterior part; the greater extent of its surface is convex, and adapted to the inner surface of the retina, and ciliary body: anteriorly, it presents a cup-like depression, into which the crystalline lens is received; and immediately around this depression, the hyaloid membrane is marked by the folds of the ciliary body, and presents elevations which correspond to the intervals of the plicæ, or folds, which form part of the ciliary body: a beautiful disk is presented around the circumference of the crystalline lens, by these marks on the hyaloid tunic; and, usually, a portion of pigment remains on this disk when the choroid is removed.

The greatest part of the vitreous body is, pos-

teriorly, in contact with the inner surface of the retina, with which it has only connection by blood vessels ; more anteriorly, it is immediately opposed to the inner surface of the ciliary body ; and quite anteriorly, the posterior capsule of the crystalline lens is received into the cup-like depression.

The hyaloid membrane, or capsule of the vitreous fluid, not only covers the exterior of the body, but it forms numerous cells, internally, in which the fluid is contained : the cells have a regular arrangement and wedge-like figure ; the narrow part being towards the centre, and the wide part to the circumference ;—the cells communicate ; the membrane is extremely delicate, and forms a small portion of the body.

The fluid has a specific quantity, rather greater than that of water, being about 1000.9 to 1000, it communicates a sensation, like that of white of egg, to the touch : its chemical analysis, according to Berzelius, is

Water	98.40
Albumen	0.16
Muriates and lactates	1.42
Soda, with animal matter, soluble in water	0.02
	<hr/> 100.00

Its refractive power is 1.3394.

The organization of the vitreous body is de-

rived from the central artery of the retina, and from the vessels of the retina itself:—an artery, which can be readily injected in the foetal eye, arises from the central artery as soon as it has penetrated into the globe, and passes through the vitreous body, to the posterior capsule of the crystalline lens, on which it spreads out in a number of very minute branches; in its course through the vitreous body, it probably sends some branches to the hyaloid membrane. Mr. Dalrymple has succeeded in injecting a number of minute ramifications, of very delicate vessels, on the periphery of the membrane, derived from a branch or branches of the central artery, which passed by the spot termed the foramen of Soëmmering; he kindly permitted me to inspect the preparation, which was most satisfactory, but which, I much regret, has been since destroyed by accident; besides, some minute vessels pass from the arteries of the retina, at its anterior termination, to the hyaloid membrane, (where marked by the striæ of the ciliary body,) towards the circumference of the lens.

Neither nerves nor absorbents have yet been detected in this structure.

The vitreous body performs an important office in the organ, by modifying the refraction and dispersion of the rays of light, as they pass to the retina.

OF THE MORBID CONDITIONS
OF
THE RETINA.

1. THE functions of the retina are frequently disturbed, and sometimes destroyed, by disease of the choroid tunic, *as I have already described.*

2. Its functions are sometimes disturbed, or destroyed, by causes which affect it alone, without, however, producing any perceptible change in it.

3. It is liable to a congested state of its vascular layer, which affects its functions.

4. It is affected by inflammation of an acute and chronic character.

5. It is subject to organic changes simple and malignant.

6. Its functions are disturbed, or destroyed, by disease which immediately influences the optic nerve.

7. Its functions are disturbed, or destroyed,

by a morbid state of that portion of the cerebral mass, with which its nerve or nerves are most intimately connected.

OF DIMINUTION OR LOSS OF VISION FROM
AFFECTION OF THE RETINA ONLY,
WITHOUT ANY PERCEPTIBLE
CHANGE IN STRUCTURE.

IN all cases in which the function of the retina is completely annihilated, I believe that the optic nerves invariably shrink: I have found in some instances of long continued amaurosis, little more than the neurilema remaining:—this shrinking always extends from the sclerotic to the optic commissure; and I have seen it continued, beyond the commissure, as far as the quadrigeminal bodies; this change is, however, a consequence of the destruction of the power of the retina, and not the cause.

Shrinking of
the optic
nerves a con-
sequence of
amaurosis.

Gradual or sudden diminution, or loss of vision, affecting a part or the whole of the field of vision: if the function of a part be destroyed, that of the remaining portion is usually imperfect; but, occasionally, one part may become insensible, whilst the other part retains its ordinary power.

vi- Symptoms.

Appearances.

Pupil dilated, usually round and fixed, the motive power of the iris being destroyed; sometimes, however, the pupil is irregular, being oval or slightly angular; this occurs, generally, when the amaurosis is partial and imperfect; and the principal point of irregularity in the pupil very frequently corresponds to the most insensible part of the retina; under these circumstances, also, the iris has usually a sluggish motion; and, occasionally, it is tremulous. In general color, and brilliancy, the aspect of the iris, in most cases, remains unchanged; but, now and then, it appears duller than that of the sound eye. In partial or imperfect cases of this description, there is scarcely any perceptible deviation from the natural appearances, in the affected eye, if examined whilst the sound eye is exposed, as the iris of the affected eye often acts in sympathy with that of the sound one; but a marked deficiency of action is often perceptible in the iris of the affected organ, as soon as the sound one is obscured.

Causes.

Want of exercise.

1. A very common cause of imperfect functional amaurosis is the non-exercise of the organ; as in a person who squints, and uses only one eye for minute purposes; or as in those who require the aid of an artificial lens to distinguish small objects, and who use a single glass always to the same eye: in either case, the eye not

much employed loses power, and, if neglected, eventually becomes useless, proving that the retina requires exercise to maintain its power.

2. Excess of the ordinary stimulus, (light,) or Excess of light.
its too great brilliancy, disturbs or destroys the functions of the retina. Every one is familiar with the dark spectra which result from looking at the sun, or any bright luminous object, for a short time, and can easily comprehend how excess of light may occasion loss of sight. When the light falling upon the retina is very brilliant, and unexpected, it may destroy the functions of the retina, in part, or in toto, in an instant.

72. Thus the artist who was engaged to take Case.
the panoramic view of London from St. Paul's cathedral, for the Colosseum, was intently regarding some object by the aid of a camera lucida, when the transit of a dark cloud allowed the brilliant rays of the sun, concentrated by the instrument, to strike, unexpectedly, upon the retina, in the axis of vision : the effect was instantaneous palsy of that part of the retina, which has not recovered its function ; but that of the surrounding parts remains perfect.

In the same way, vivid lightning acts in pro- From light-
ducing amaurosis. I do not believe that the ning.
electric fluid has much, if any influence in causing the blindness ; as I hardly conceive it possible that such an effect, only, would result from

so powerful an agent ; though, in a less destructive form, I can imagine that electricity might annihilate nervous function.

Reflected light. The continued influence of a strong light, disturbing or destroying the power of the retina, is well known to the inhabitants of the colder climates, where the surface of the earth is covered with snow for months together, and, consequently, reflects a large quantity of brilliant light ; and also to those frequenting the tropical seas, from the surface of which the light is most powerfully reflected.

On retina
morbidly sen-
sible.

An ordinary degree of light may so over-excite the retina, when in a morbid condition, as, by degrees, to destroy its power : thus, in long continued cases of scrofulous ophthalmia, attended with great intolerance of light, I have known patients become amaurotic, without any perceptible organic change ; and in whom I could not attribute the loss of vision to any other cause, than the effect of long continued over-excitement, in the manner I have mentioned.

Concussion.

3. Concussion, from a shock, which does not produce any perceptible organic lesion, is a frequent cause of partial or complete amaurosis.

When the eye is unprepared for violence, a very slight blow will destroy the functions of the retina ; but if the violence be expected, it will sustain a violent concussion without serious injury.

The following is a very remarkable case of amaurosis from slight violence.

73. A young man was amusing himself by Case. looking at some gentlemen who were shooting at pigeons from a trap, and he stood at the distance of above two hundred yards from the shooter. Immediately after a shot had been fired, he was sensible of having received a slight blow, on the outer side of the globe of one eye ; which produced a slight stinging pain of momentary duration : some confusion, in vision, induced him directly to examine the state of both eyes ; and he discovered that he could not perceive light with that which had been struck. On the following day, he applied at the Ophthalmic Hospital, when I found the pupil dilated, and the iris motionless, and a small ecchymosed spot, about the size of a large pin's head, between the outer margin of the cornea and the external canthus ; there was not any lesion of the conjunctiva, or sclerotic, but merely a slight extravasation of blood between the two ; he was completely amaurotic with the eye, and remained so, in spite of all treatment, which was carefully pursued for many weeks.

74. I have seen two cases of amaurosis, from Cases. blows inflicted by the end of a whip lash ; in one instance, the sufferer was seated at the back part of a stage coach, outside ; and, in the other case,

the patient was driving in a gig, and passing a stage coach, at the time he received the injury. In neither case was there lesion of membrane, but slight ecchymosis and subsequent ophthalmia, one remained amaurotic, and the other recovered completely ; but, in the latter case, the amaurosis was not complete at first.

Blows on the
eyebrow.

I believe that those cases, in which an amaurotic condition follows injury to the supercilium, or forehead, in the situation of the expansion of the supra-orbital vessels and nerves, are not the result (as is generally supposed,) of sympathetic influence, between these nerves and the retina, but the effect of immediate injury to the retina itself, by concussion; or of slow change, consequent on such injury of the retina, or of the brain.

Narcotics.

4. Some of the narcotics appear to exert a peculiar influence on the functions of the retina, when conveyed into the system, by absorption from a broken surface, or through the stomach ; whilst the free application of them, to the surface of the sound skin, does not occasion any injurious effect : this I have observed particularly with belladonna, and other narcotics which possess somewhat similar properties.

Effect of bella-
donna.

I have applied the extract of belladonna to allay the suffering connected with surfaces exposed by malignant ulceration, and have found a temporary amaurosis to result ; and I have

repeated the application, so as to be perfectly satisfied that the amaurosis was produced by the influence of the belladonna.

Several other poisons, animal and mineral, as well as vegetable, affect vision ; but, at the same time, they disturb the functions of the stomach, heart, or brain.

When an amaurosis of imperfect character has arisen from want of due exercise of the organ, the obvious remedy is to give it the proper degree of exercise to restore the lost power ; and this is, in fact, the only means of exciting the retina to its natural degree of activity. It is, I consider, best done gradually, to prevent the risk of any congestion, which would be likely to result from the constant use of a weak organ. Thus, let the patient use the weak eye, for a quarter or half an hour, on small objects, two or three times in each day ; and, afterwards, gradually increase the period of exercise, until the eye can be employed for hours together without much inconvenience : thus, the power of the retina will be gradually restored.

Treatment.
If from want
of exercise.

When the weak eye is in use, the perfect one must be obscured.

It requires much perseverance to effect a cure in most of these cases.

There is a circumstance of much importance connected with these cases, which I have only

recently noticed, but which I now find to be nearly constant; it is, that with the diminution of vision, there is a corresponding diminution in the power of adaptation of the eye to near and distant vision; distant objects are discerned more readily and distinctly, than those near; but the perception of objects close to the patient is much improved by the aid of a convex glass; thus, a condition, like that termed presbyopia, exists;—usually also, in these cases, the iris of the affected eye, appears to act freely when examined and compared with the other; but, if it be examined independently, the pupil dilates as soon as the sound eye is obscured; and the iris moves tardily, as light is admitted to the retina, or prevented from passing to it. Very many persons employ one eye more than the other, and have not, consequently, equal power of vision with the two eyes; but the difference is, in most instances, so trifling, that it is not noticed, or detected, unless the powers of the two be tried carefully, on minute objects. Occasionally, a very considerable difference in the power of vision, of the two eyes, exists, without the patient being aware of it, until some accidental circumstance leads to its discovery; the affection is, then, usually supposed to be of recent occurrence; and both patient and medical attendant are, not unfrequently, deceived respecting it.

75. Very recently, a medical gentleman wrote Case. to me respecting a younger brother, whom he stated to have a serious amaurotic condition of one eye, which had occurred suddenly, without any symptoms indicating congestion, or inflammation in the eye, head, or orbit ; he further stated that the appearance of the eye was natural, but had lost the power of distinguishing a print of moderate size ; the patient had been blistered, purged, &c., without obtaining any relief. I requested that the young gentleman should try a convex glass, and that the affected eye should be carefully examined, independently of the sound one ; and that if the pupil of the affected eye dilated, and the motions of the iris proved sluggish, (the perfect eye being obscured ;) and, if further, that the power of vision became increased, by the artificial aid, he should merely exercise the imperfect organ in the way which I have described, and otherwise, try to maintain a good condition of the general health. The convex glass did, materially, improve the vision, and the iris was found to be sluggish, and the pupil somewhat dilated, when the sound eye was obscured ; and, therefore, the treatment I suggested was adopted, and from it, he has obtained perfect relief. I have no doubt that, in this case, the degree of amaurosis had been gradually produced by non-exercise of the eye ; and

that the vision had been very imperfect, long before the imperfection was discovered.

The absence of all symptoms of congestion, or inflammation, the accidental discovery of the imperfection, and the improvement of vision by the use of a convex glass, are the circumstances which would, principally, indicate the condition of amaurosis, now under consideration.

During the period, in which a single eye-glass or quizzing glass was in use, very many persons lost vision in a great degree, with one eye, in consequence of applying the glass constantly to the same eye, and thus leaving the other unexercised or unemployed: it is not uncommon, to find one eye of the jeweller, or the watchmaker, imperfect, for the same reason, viz., using the magnifying glass, required in their work, constantly to the same eye.

In these cases, when the patient has lost the power of distinguishing a large print, and when the affection has been of several years' duration, especially in the adult, the prospect of recovery is very limited; it is always worth while to try the plan I have advised, for a few weeks, which will enable the medical man to judge of the probable effect of a continuance of the treatment: if no decided change take place in the course of five or six weeks, little good is likely to result from further continuance of any treat-

ment. So long as the patient retains the perception of a large print, I believe that a complete restoration of vision may be effected, by steady perseverance in the means I have recommended.

76. A gentleman called at my house to con- Case.
sult me, having lost the vision of his left eye, a few months previously, by accident : his right eye had been imperfect for many years, so that upon his recovery from the immediate effects of the injury, he could just see to guide himself : being, however, compelled to use the right eye, its power had become so much augmented in the course of a few months, that when he came to me, he could see to read a large print ; the improvement had, at first, been very slow, but had gradually become more rapid. He sought my advice for the left eye, hoping that I might be able to restore vision by operation ; but I found the eye disorganized.

Amaurosis resulting from the influence of too If from too
much or too brilliant a degree of light on the brilliant light.
retina itself, is generally of sudden occurrence, and most frequently it is perfect ; it usually affects the entire field of vision, though, (as in the case of the artist,) it may be partial, or affect only one portion of the retina. Most of the cases of amaurosis of slow progress, supposed to result from the influence of too much light upon the retina, arise from a congestive or inflamma-

tory condition of the choroid coat, and the effect on the retina is secondary. *See Diseases of the Choroid.*

The effect of a too brilliant light on the retina is very similar to the effect of concussion of this membrane, not only in its immediate, but also in its remote consequences ; and requires a similar plan of treatment. Before describing this, however, I have to observe that the mischief likely to result from the effect of light on the retina, in a state of morbid sensibility, may be easily avoided, by excluding the light, until the extreme sensibility has subsided.

If from
concussion.

The immediate effect of concussion, as that of a too brilliant light upon the retina, is usually sudden, and may destroy the function of a part, or of the whole, of the tunic ; or the function may be only rendered imperfect—the remote effect of either is inflammatory action. In these cases, when the function of a part, or of the whole, of the retina is entirely and immediately destroyed, I believe that it is rarely, if ever, restored : I have seen very many such cases, and have adopted a careful and continued treatment, without any good effect. When the amaurosis is incomplete, the function of the retina, in most cases, is restored, provided that the medical attendant prevent any destructive inflammatory action ; and this is to be done by rest, quiet,

local bleeding, moderate or abstemious diet, and purgatives ; or when these are not effective, by mercury, and counter-irritation by blisters applied near the eyebrow. After all inflammatory symptoms have disappeared, electricity or galvanism assists in expediting the recovery of the nervous power ; strychnine might do the same ; but I believe that such cases recover equally well, though not quite so rapidly, in some instances, if the eye be simply exercised, in a manner similar to that already described.

A very insidious form of chronic inflammation of the retina, sometimes takes place, days or weeks, after the immediate effects of such injuries have passed off; much as slow but important mischief occasionally follows concussion of the brain : the patient should be warned respecting the probability of such an occurrence, in order that he may, by prudent diet, and by careful use of the organ, guard against it ; or in case of its arising, that he may apply for aid in good time. Remote effects
of concussion.

Disturbance of the functions of the retina from the influence of narcotics, which do not create any other injurious effect, subsides on removing the cause, or withdrawing the use of the narcotic. If from narcotics. When the amaurosis is accompanied by other morbid affections, as of stomach, head, &c., the cure requires great care and attention,

and a plan of treatment, the explanation of which lies beyond my present limits.

OF CONGESTION OF THE RETINA.

I BELIEVE that a state of vascular congestion sometimes occurs in the retina, without any inflammatory action.

Symptoms.

Slight confusion of vision, with the appearance of flashes of light, coruscations, or sparks, usually white or of light red color; a sense of fulness of the globe, with uneasiness, and sometimes darting pains: these symptoms quickly subside when the organ is allowed to remain quiet, and is kept from the influence of much light.

Appearances.

Pupils smaller than natural, though the irides may be active: the surface of the globe exhibits, usually, more vessels filled with red blood, than under ordinary circumstances; and I have further observed that patients, subject to this affection, have a peculiar staring appearance.

Causes.

As affecting the retina only, or principally, over exertion of the organs is the principal cause; as affecting it, in common with the other textures, plethora, or too great tension of the vascular system is one cause, and the excessive local determination consequent on some of the febrile diseases is another.

I have only recognized two well marked cases Persons liable to. in which the affection appeared to be almost confined to the retina; and, in both of these instances, the patients possessed unusually high nervous susceptibility, with active and powerful imaginations; and the attacks most frequently occurred during continued mental excitement, with close employment of the eyes. In one patient, the symptoms occurred a few times after unusual indulgence in the luxuries of the table, and the excitement of company.

Relaxation of mind and rest of the organs, Treatment. were sufficient, in these instances, to allow of perfect recovery of the retina; and the recurrence of the symptoms has been very trifling and rare, since the patients have, by my advice, avoided the exciting causes.

I was fearful, and think it probable, that inflammation might have been set up in the retina, had the state of congestion been promoted much more frequently.

OF INFLAMMATION OF THE RETINA.

RETINITIS.

Synonyme.

Pure retinitis, or inflammation confined to the retina itself, I believe to be a very rare disease;

I have witnessed a few cases which I considered to be of this kind, and one, in which I could most satisfactorily distinguish a portion of the membrane, which had become disorganized under the morbid action.

Symptoms. Part, parts, or the whole, of the retina becoming nearly or completely insensible to the ordinary impressions, with the frequent or permanent appearance of sparks, luminous spots, corruscations, circles, &c., varying in color and brilliancy. Sometimes uneasiness in the globe, especially after exertion of the organ; and frequently a dull aching pain about the situation of the supra-orbital notch.

Appearances. In most of the cases which have come under my observation, the affected eye, when examined exclusively of the sound one, has presented a pupil more dilated than natural, and a sluggish condition of the iris; but, with one exception, I have not been able to detect any other morbid condition of the various textures of the organ.

Causes. The defect has been attributed, by most of the patients, to over exertion of the eyes on minute objects; or exposure to very bright light; in every instance which has presented itself to me, there has been derangement of the general health, which has probably predisposed to the ocular affection.

Treatment. I have treated all the cases which have come

under my care on the same plan, and with the best result; excepting those in which organic change had taken place. I have directed a simple and nutritious diet, moderate exercise, perfect quiet of body and mind, strict attention to the most important secretions, small doses of mercury, so as not to risk the production of salivation, and the use of counter-irritation, by small blisters above the eyebrow, in nearly half of the cases which I have been called upon to manage; I have also deemed it requisite to give some mild medicinal tonic.

77. In the summer of 1838, a man of middle Case. age, rather tall and thin, and of indifferent general power, employed as a watchmaker, applied at the Ophthalmic Hospital, complaining of imperfection of sight of the left eye, and the appearance of a luminous spot immediately in the axis of vision; he had also a sense of fulness in the globe of the eye, and, sometimes, a dull pain about the situation of the supra-orbital notch: the symptoms were increased by exertion of the organs; but some imperfection of vision, and the luminous spot, constantly plagued him;—a portion of the retina, immediately in the axis of vision, had nearly lost its sensibility, but the eye appeared quite healthy.

The patient's pulse was rather feeble, and his general aspect indicated deficiency of power. I

prescribed a simple, but nutritious diet, with a moderate portion of porter, (the stimulus to which he had been accustomed,) moderate exercise, but entire relaxation from business, and perfect rest of the eyes; I ordered five grains of Plummer's pill, every other night; compound decoction of sarsaparilla, thrice a day; and a blister above the eyebrow, of small size, not to be kept open, but to be repeated as soon as the surface would allow of it. The patient soon lost all sense of fulness or uneasiness about the eye; the obscurity of vision was lessened, and the luminous spot became less brilliant and defined; gradually, all symptoms of diseased action in the eye subsided, and, in about seven weeks, his vision was perfect, and he was free from all uneasiness.

Case.

78. A lady, aged fifty, married, but without children, came from the West of England to consult me, in consequence of imperfection of vision in one eye, and the constant appearance of some white luminous spots: they varied in number and in intensity, being usually more numerous and brilliant after a full meal; after any unusual excitement; and on first taking the recumbent posture: she had occasional uneasiness about the head, but not continued headache, or giddiness; and she described the globe of the eye to feel as if a little enlarged, and stiff

in its motions : a sudden and rapid motion of the eyes, instantly made the luminous spots more vivid. All uterine action had ceased, and the important secretions were regularly performed, excepting that there appeared to be too much tension of the vascular system ; the pulse being rapid, hard, and incompressible : the nervous susceptibility was naturally great, and she was easily excited ; her alarm respecting her eyes was excessive : the pupil of the affected eye was rather larger than that of the perfect organ, and the motions of the iris somewhat less active ; but I could not detect any other unusual appearance, and even that, which I have mentioned, was to a very trifling extent.

I had her cupped behind the mastoid process, on each side of the head, and she lost about twelve ounces of blood ; I gave her, each night, a grain of calomel, and three grains of blue pill ; and every other morning, an aperient draught of decoction of aloes and sulphate of potash, which operated actively : at the same time the diet was confined, principally, to light farinaceous food, milk, and fish ; and on the second day a blister was applied to the forehead. Within five days, the more urgent symptoms were subdued, and there only remained slight imperfection of vision, and two or three dull luminous spots which pre-

sented nearly the same characters, under all circumstances : but she maintained, as far as possible, a state of quietude, and did not attempt to use the eyes, except in guiding and feeding herself, or for the usual ordinary purposes : I then permitted her to take a more generous diet, but still much short of what she had been, for some time, accustomed to ; and allowed one glass of wine in water, with her dinner : the blister was repeated above the eyebrow, and she commenced a mild alterative course, by taking two grains of mercury with chalk, made into a pill, with extract of hemlock, every night, and an occasional aperient draught : she continued gradually to improve as regarded vision, and expressed herself as feeling more comfortable in her general health ; and, after about three weeks' stay in London, she returned to the country, with the intention of continuing the same plan of treatment, until she had my sanction for change or discontinuance. I subsequently heard from her every two or three weeks ; and was gratified to find that she slowly recovered the power of vision, and continued well in general health : after little more than three months from my first seeing her, the vision was perfectly restored, and she had lost all appearance of spot or spark : she then, gradually, left off the medicines ; but I

strongly advised her to pursue the same careful plan of diet, and give attention to the state of the bowels.

Nearly two years had elapsed, (during which I heard nothing of my patient,) when she again called upon me in London—having experienced some return of her former symptoms, but in more moderate degree;—I did not at first recognize her, in consequence of her being dressed in very deep mourning; but, a brief statement of her case soon recalled to my mind the history of the former attack. I also discovered that this second attack had quickly followed great mental anxiety, of several weeks' continuance, during the fatal illness of her husband. There was a very marked difference, in general circumstances, between the second and first occurrence of this affection. I have described that during the first attack, the vascular system was too tense, and the circulation too rapid; but on the second period of her visiting me, I found much general depression, with rather a feeble and easily compressible state of pulse; so that I was obliged to modify the treatment accordingly; and, therefore, directed her to take a good diet, with a moderate quantity of wine; and prescribed, in addition to the alterative medicine, small doses of ammonia and cascarilla: she was again relieved from the ocular affection, by persevering in the alterative

and mild tonic treatment, with the aid of occasional counter-irritation, as during the first attack ; but the recovery was more protracted, (although the disease was not so severe,) and I believe this arose, principally, from the counter-acting influence of mental distress.

Case.

79. I have lately seen a young lady of delicate appearance, and possessing but feeble power, who had for some time suffered from pain and uneasiness in the left eye, with a frequent appearance of bright and colored luminous spots, and a gradual diminution of vision extending over the whole field ; for some weeks previous to my seeing her, some of the luminous spots had become permanent. After an attentive examination of the eye, I could not discover any evidence of organic change, although she could scarcely distinguish light from darkness with the affected eye ; when the good eye was covered, the pupil of the disordered one dilated a little, and the iris remained nearly motionless : she suffered, also, a good deal from gastric derangement, being flatulent, having nausea, and a very indifferent state of appetite.

I directed, for her, a plain diet, to consist principally of milk, toast, a small portion of fresh meat, farinaceous matter, and a little weak brandy and water at dinner ; moderate exercise, daily, in the open air, when the weather per-

mitted; and warm clothing; I prescribed one grain of mercury with chalk, six grains of the trisnitrate of bismuth, every night, one ounce of the compound decoction of aloes, one drachm of the tincture of senna, and from one to two drachms of the tartrate of potash, every other morning, and a small wine-glass full of a cold infusion of sarsaparilla, in lime water, twice in each day; a small blister to be placed just above the eyebrow, and to be repeated as the state of the part would allow;—the eyes were to be protected from very bright light; and to be kept as much at rest as possible.

Between two and three weeks elapsed before any sensible improvement took place in the eye, though the condition of the stomach was materially changed for the better; but rather suddenly, after the application of a fourth blister above the brow, she nearly lost all appearance of the luminous spots, and all sense of uneasiness about the eye; the vision, however, remained much the same: I recommended a steady perseverance in the treatment under which the general health was gradually improving, being fearful of producing relapse, by pushing the more powerful remedy, whilst the general power was below par, and the stomach still rather irritable. A very slow but favorable change took place in the eye; first, the light became more

brilliant; then she began to distinguish large objects; and can now, at a period of about ten weeks from the commencement of the treatment, recognize persons, in a favorable light; and every few days gives satisfactory evidence of a gradual amendment: she has not been able to detect any luminous spots for more than three weeks.

As in the foregoing cases, no morbid change could be detected, the positive existence of inflammation might be disputed; and indeed many might doubt that the symptoms were caused by disturbance in the retina itself: the following case will, however, I think, tend to dissipate such doubt, as it proves that disease of retina creates a train of symptoms, very similar to those presented in the cases which I have related.

Case.

80. A gentleman, about forty-eight years of age, a native of England, but who had resided above thirteen years in Jamaica, having a dark complexion, dark hair and irides, was induced to return to England, in consequence of total loss of vision in the left eye, and partial loss of that of the right, which he had been informed resulted from cataracts: on his arrival here, he called to consult me, and made the following statement of his case. He had suffered from severe and repeated attacks of fever, for which he had been actively treated, principally, by large doses of

mercury ; but although much reduced by each attack, he had, in most instances, regained his strength rapidly. After an attack of fever in 1825, the vision of the left eye began to fail : first, he was troubled with grey and dark muscæ ; these gradually increased in number and size, and the whole field of vision became misty, or gauzy ; and, by degrees, the mist thickened, so that in a few months he lost perception of light with the left eye ; he did not recollect to have suffered any pain, nor was the eye observed to be red, at any time, during the progress of the disease : he had never been able to distinguish light with the left eye, since the early part of the year 1826. I found that considerable morbid changes had occurred in the left eye ; the iris was dull and a little discolored ; its pupillary aperture was very irregular, though the pupil was of considerable size ; the margin of the membrane was adherent in great part to the anterior capsule of the crystalline lens, which was densely opake, and occupied the greater part of the space of the pupil ; the lens itself had been absorbed : that portion of the pupil not occupied by the opake capsule, appeared dark and brilliant ; and had the retina retained any power, there was nothing to prevent the passage of sufficient light to it, to afford vision ; besides, the iris was slightly tremulous, and the globe softer

than natural. I believe that this eye had been destroyed by chronic inflammation, commencing in the choroid, and from thence extending to the iris, and from it to the capsule of the lens; and that such organic change had occurred, as rendered recovery hopeless. In the year 1834, this gentleman had two violent attacks of fever, and subsequently suffered from dysentery, which continued nearly twelve months; he became, in consequence, so reduced and feeble, that he could not move, for many weeks, without assistance. In August, 1835, he first perceived some *muscæ* with the right eye, when recovering from his severe and tedious illness; and these increased, in number and size, (much in the same way, and as had happened in the left eye previously;) at the same time the whole field of vision became misty, but he could see to read tolerably well, by the aid of a convex glass. In February, 1836, his health being sufficiently restored, he resolved to come to England for further advice; expecting, however, to obtain relief in both eyes, by operation. Whilst on his passage, the vision of the right eye diminished further, and he found that he could distinguish objects more clearly when placed a little below the eye, than when directly on a level with the organ, or a little above it; and the more elevated, the more indistinct an object became;—on his

arrival in England, he could only make out a large print with the assistance of a strong magnifying power; and he could not discern any object, placed a little above the axis of vision, unless the eye was turned up unusually; (*visus dimidiatus*;) the upper half of the retina only appeared to retain any power, and that was very imperfect; he now experienced luminous oscillations and circles which undulated, and these he referred to the lower part of the globe; he had not had any pain, or redness of the eye. I found the iris rather dull, and sluggish in its movements, but the pupil round and of moderate size; the pupil itself appeared dark and brilliant at a short distance, but, on close inspection, a dull yellow tinge could be perceived, especially on looking towards the inferior part of the globe: on producing a full dilatation of the pupil by the influence of belladonna, I discovered that this yellow tinge resulted from the reflection of a part of the retina, which had become opake; it was of a dirty yellow color, slightly plicated, (much as the retina is found to be near the optic nerve, when examined two or three days after death,) and the change affected more than one third of the membrane; the vision was somewhat improved by dilatation of the pupil. Sometime before he began to notice that he could not distinguish objects above the eye, so well as

when placed below it, and since he had noticed the luminous appearances, he had in a great measure lost the grey and dark muscæ, but one large one remained. I believe that the disease in the right eye, had also commenced in the choroid, and had affected the iris very slightly ; but that inflammation of a most insidious character had attacked the retina, especially at the lower part, (which probably extended from the choroid,) and had slowly disorganized that portion of the tunic ; from the subsidence of the muscæ, on the appearance of the luminous circles, &c., I consider that the disease in the choroid abated, as that in the retina became developed.

By my advice, a careful alterative and tonic treatment was adopted, for several months ; the gums were made slightly tender, but the strength was promoted and maintained by a generous diet, and by sarsaparilla, or bark ; and I believe that by these means he has been saved from a perfect state of amaurosis. After a lapse of two years there is very little change in the power of vision ; he can still see to make out a large print with a good magnifying power : altogether, perhaps, he does not possess quite so much power of vision, as when first I saw him ; but, looking back to the progress of the disease, before he came to me, I cannot doubt that the treatment

has been of essential service to him—indeed, as regards his general health, he has, undoubtedly, gained very much ; of which his appearance and feeling afford satisfactory evidence.

OF INFLAMMATION OF THE RETINA, EXTENDING TO THE VITREOUS BODY, AND CRYSTALLINE LENS.

RETINITIS—glaucoma;—the latter term being Synonymes. applicable when the disease has extended to the vitreous body, and occasioned a change, from which the humor presents a green color.

Most frequently, the disease is of slow pro- Divisions. gress, and not attended with much suffering—but, occasionally, it runs through its stages with extreme rapidity, and is productive of intense and distressing pains—hence, we recognize a chronic, and an acute form. I shall describe the chronic affection first, as most common, and offering the best means of tracing the origin and progress of the disease—in continuation, as it were, of the last subject.

OF CHRONIC RETINITIS AND GLAUCOMA.

Symptoms. THE disease commences either with slight dimness of vision, accompanied with occasional flashings of light, or appearance of sparks ; or the scintillations and flashings are the first indication of diseased action, and are followed soon by a diminution of visual power. The entire field of vision is usually dull or misty, but, occasionally, one part of the retina retains more sensibility than the other parts ; the vision is generally improved by a strong and steady light ; and the patient therefore sees best on a clear and cloudless day, provided he be not exposed directly to the sun's rays.

Often, from the commencement, the patient complains of a dull pain near to the site of the supra-orbital notch ; usually, the pain is remittent, being severe only for short periods ; or it is sometimes intermittent, though not with any regularity ; occasionally, there are more extensive circum-orbital pains about the temple, forehead,

or cheek. The symptoms augment by degrees, the vision becomes more obscured, the pain more constant and severe, as well as extended, and the luminous appearances occur in greater variety and number; there is, however, much difference in the amount of pain, and in the degree of flashing in different cases. I have observed that they are usually proportioned to the progress of the disease, being trifling when it is slow, and more urgent as it is rapid. I have known the disease to pass through all its stages, to the destruction of sight, without pain, but never without some scintillations or luminous appearances.

There is an almost endless variety in the luminous appearances, in different cases; from a single small spark or bright spot, to the most vivid and brilliant corruscations, or flashings; sometimes, there is a semblance of fire-works; sometimes, bright circles of unequal brilliancy, fixed, or in motion, and, occasionally, spreading out and vanishing, as the circles created by the falling of a stone on the surface of a smooth pool; at other times, the figures are oblong or square: they are seldom very troublesome in the early stage of the chronic disease, but often continue a length of time after vision is lost.

In the commencement of the affection, there is further, usually, a loss of the power of adapting

the eye to near and distant objects, so that anything, seen with distinctness in one position, becomes indistinct or lost, if its relative distance be changed : I do not, however, consider this to be the result of retinal disease, as I shall explain in another place.

As the disease advances, objects which present much length or height often appear distorted ; (*visus diffiguratus* ;) no doubt, from error in refraction, in consequence of change in the vitreous body or lens.

The symptoms are aggravated by any thing which disturbs the circulation suddenly—as a change from the erect to the recumbent posture, fright, or any sudden mental emotion ; or whatever effects this change in the vascular system more slowly, and depresses general power—as continued mental labor or anxiety, exposure to damp and cold, derangement of digestive organs, exhausting exercise ; and they are also augmented by too much use of the organ itself.

The symptoms are mitigated by whatever tranquillizes the circulation, and promotes its power gradually, and tends to maintain it in equal balance : thus, vision improves and pain subsides, &c., from a few hours' quiet sleep ; and a similar effect results from a moderate nutritious meal.

Although the vision is a little improved by a

bright day light, artificial light appears to afford little or no assistance.

Sometimes the globe is tender to the touch, and, frequently, there is a sensation as if some fine foreign particle or particles were lodged on the surface of the conjunctiva.

There are usually two circumstances to be Appearances. observed as presenting deviations from the natural state of the organ :—first, a somewhat dilated and oblong pupil ; and, secondly, a dull opake spot in the pupil. At an early period of the disease the pupil loses its circular figure, though very slightly so, at first, and is generally elongated upwards and inwards, in a direction towards the trochlea of the superior oblique muscle, but the direction of the elongation occasionally varies ; the alteration is upwards and inwards, in at least nineteen cases out of twenty ; next in frequency, the elongation takes place upwards, now and then upwards and outwards, and very rarely downwards : besides the elongation, there is always a general dilatation, and the motions of the iris are sluggish ; by degrees the pupil becomes more and more dilated, more irregular in figure, and the motions of the iris more impeded. At an early period, also, the space of the pupil loses its blackness, and has a greyish or greenish appearance of unequal density ; there being usually a spot offering more

discoloration, and some degree of opacity, which at first view resembles the commencement of cataract, (for which it is often mistaken;) the distinction is, however, simple: when cataractous opacity exists, it occupies the central part of the lens, in ordinary cases, and the opacity maintains this relative position, whatever may be the incidence of the light, or whatever may be the position in which the pupil is regarded; whereas, the opacity, consequent upon chronic glaucoma, (whilst partial,) always changes its position according to the incidence of the light; so that it appears central, (as the cataractous opacity,) when the light falls directly upon the pupil; but if the light fall from the temporal side of the organ, the opacity seems to be on the nasal side of the pupil; or if the rays be incident from the nasal side, the opacity is seen towards the temporal part of the pupil; thus, the opaque spot changes its position, as the eye is moved, or as the patient changes his position: it resembles the reflection of the sun or other luminous body from a muddy pool, and is not a positive opacity. Besides the change in position from altered incidence of light, the opacity, in glaucoma, is distinguishable from that of cataract, in not appearing so near the surface, as that which takes place in the lens.

As the disease advances, the turbidity of the

vitreous body increases, and the opaque spot becomes more dense, and assumes a decided green tinge, in many instances;—the term *glaucoma*, from *glaukos*, *seagreen*, is applied to the disease when the green tinge is apparent. After some time, the iris loses its brilliancy in some degree, and becomes slightly altered in color; and, usually, some large and tortuous vessels appear in the conjunctiva of a dark red or purple color; they pass from the margin of the cornea towards the direction of the recti muscles.

As the perception of light ceases, the patient acquires the vacant aspect which is so characteristic of amaurotic affections.

Lastly, the lens becomes opaque, and cataract really exists; but it usually has a green or dirty yellow color—although I have seen it of a beautiful deep sea-green color. At the same time, the pupil becomes extremely dilated and fixed; the distended vessels of the conjunctiva increased in number; the globe acquires a hard and inelastic feel, and the eye appears more prominent than natural. This disease, unchecked, usually passes through its different stages in the course of a few months, sometimes, in only a few weeks; but, under careful management, I have known it to be retarded for years, so as to preserve some useful vision; but this is rarely to be accomplished.

The diminution of vision is not at all in pro-

portion to the visible organic change; for it is generally lost for all useful purposes, before there is much apparent change in the vitreous body, certainly, before the change is sufficient to account for the diminution of function in the retina; which is a strong argument in favor of the opinion, that some change in the retina precedes that in the vitreous body.

The changes in the vitreous body and in the lens are apparent, during the progress of the disease, and, in a great measure, prevent us from observing, accurately, the condition of the retina. It has been stated, that no morbid change can be detected by anatomical examination, after death, in the retina of the eyes of those who have suffered from glaucoma; this I think probable, inasmuch as an exceedingly slight change may take place, which our imperfect acquaintance with the healthy structure will not enable us to recognize; and, further, so rapid is the change in this delicate membrane after death, that a very few hours occasion a great difference in its appearance.

I consider this disease to afford a very beautiful illustration of the extension of morbid action, by vascular connection.

First,—disturbance is evinced in the retina, by flashings, sparks, &c., by diminution of vision, and, further, by sympathetic pains.

Secondly,—the vitreous body becomes affected, and undergoes a slow change, losing its transparency; and

Thirdly,—the lens becomes opaque.

Thus, after morbid action has been fairly set up in the retina, supplied as it is by the primary divisions of the central artery, the vitreous body, the next part which is supplied by the continuation of the arterial distribution, soon participates in the disease; and, subsequently, the crystalline lens, which is principally organized by the extreme divisions of the same vessel, becomes affected, and undergoes a marked morbid change.

Consist in derangement of some important function, with an unequal balance of circulation and nervous power; these I consider, however, rather as causes, than effects of the local disease; for they are co-existent with the development of the disease. General symptoms.

It is a disease almost confined to persons above the middle period of life; it is more frequent in females than in males, and occurs, usually, in persons having dark colored irides. Persons liable to. It very rarely commences in both eyes simultaneously; though it seldom exists long in one eye, without the other becoming affected; but I have seen it disorganize one eye, whilst the other remained sound.

Causes.

The predisposing causes of this affection are such as derange any of the principal functions, and tend to disturb or destroy the balance of the circulation, and of nervous power; but especially such as, at the same time, depress or exhaust general power. Excess of mental labor, or anxiety, is sufficient to produce the effect; but it is particularly prone to do so, when operating upon a system in which disturbance has been previously excited—as during a change in, or arrest of, uterine action; or from the arrest of a long standing morbid discharge from a natural secreting surface; or from an open wound; or, further, in consequence of the cessation of frequent and habitual hæmorrhage, either uterine, hæmorrhoidal, or nasal. Again, during suppressed gout.

In persons of gouty diathesis, who have experienced for some years periodical attacks of arthritic inflammation of the foot, &c., but in whom such an attack is suddenly suppressed; or in those who have, for years, been subject to continued or periodical discharges or hæmorrhages which become unexpectedly arrested—the first stage of glaucomatous disease sometimes occurs without producing disorganizing effects; and a return of the previous affection is followed, very speedily, by the disappearance, or diminution of the ocular disease.

81. Some years since, I was consulted by a Case. medical gentleman from the North of England, who had been gradually losing his vision for some months, he had not suffered from pain, and experienced but little uneasiness; but he had been troubled with flashing and sparkling in the eyes: he had been subject to gout from an early age; but had been free from any severe attack, for a period unusually long, before his sight became affected. His health was good, and the principal functions regularly performed: he was advised to live temperately, to clothe himself warmly, and to adopt a very mild alterative medicinal course. He had so far lost vision when he came to town, that he could not guide himself without difficulty, in a strange place; he had a slightly vacant look, the pupils were more dilated than natural, and slightly oblong, and the irides were inactive; the pupils were dull and greyish, and an opake spot could be perceived in each, which varied its position according to the incidence of the light. On his return home, he pursued, very steadily, the plan advised; and occupied himself in attending, principally, to the midwifery department of his practice. Little alteration took place in his sight for some months; after which, he had symptoms of the approach of an attack of gout in the feet; the local arthritic disease soon became developed in a severe

degree ; and, as it appeared, so the power of vision improved, and he so far recovered sight, as to be able to read a large print, and could easily recognize persons, and guide himself, &c. ; thus, after being many months nearly blind, he, in the course of a few days, obtained vision sufficient for all ordinary purposes. After the attack of gout had subsided, some diminution of vision took place, but not near to such an extent as previously.

Case.

82. More recently, a gentleman, near fifty years of age, of robust make, who had usually enjoyed excellent health, with the exception of gout, which he had frequently suffered rather severely from, consulted me in consequence of defective vision.

He complained of slight mistiness of both eyes, but rather more so, of the left ; slight uneasiness in the eyeball, especially after much exertion of the organs ; also, a dull pain of the brow, under similar circumstances, with occasional appearance of small sparks, or white stars ; the pupils were large, the left slightly elongated upwards, and the motions of the irides slow ; the pupils were both rather dull, and a reflected opake spot could be distinguished in the left. I recommended him to adopt a moderate and careful diet, regular exercise, and warm clothing ; to take two grains of mercury with chalk, and

two of the extract of hemlock, every other night; and an occasional mild alkaline saline aperient; and to favor any tendency to gout, of which he had not had any attack for an unusually long period. He returned to his residence in Wales, and pursued the plan I recommended, and, after some weeks, wrote to me to say that his vision was decidedly better; soon after, he came to town again, and I had an opportunity of ascertaining that the eyes had nearly regained their healthy aspect; still I recommended him to go on with the treatment. A short time afterwards, in the autumn, he had occasion to go to Liverpool, and imprudently exposed himself outside a coach, during a cold and wet day; he felt and saw well during the journey; but, on his arrival at Liverpool, whilst taking tea, his vision began suddenly to fail him; and, in less than an hour, he was so blind that he could not distinguish a lighted candle.

Medical advice was obtained directly, and he lost blood, and took some active aperient; in the mean time he dictated a letter to me, giving me an account of what had been done. He had not experienced any pain, but his eyes felt full and uneasy, and he had luminous appearances, though he was unable to distinguish natural light. I directed him to remain perfectly quiet, and to take a moderate nutritious diet, without

any stimulus; and I prescribed two grains of mercury with chalk, with three grains of James's powder, night and morning; an aperient each other day; a large blister to the forehead, but not to be kept open; and to place the feet in a foot bath, at a temperature of 98°, (having a table-spoonful of mustard powder stirred in it,) every evening, for ten or fifteen minutes. The day after the application and action of the blister, he began again to perceive light; and, under a continuance of the means recommended, he recovered so far, as to be able to return home, by easy stages, in the course of ten days: after his arrival at home, he continued the same plan of treatment, and made slow progress, of a favorable kind, so that, at the expiration of a month from the attack, he could see a large print, in a good light: soon after this, gout attacked his hand and wrist, and became very severe; but, at the same time, a rapid improvement took place in his vision, so that it soon became nearly as good as before his journey to Liverpool, and has continued so, although all gouty symptoms have disappeared; he has, however, since, taken small doses of mercury and sarsaparilla, with lime water, which I prescribed, because he remained weak, and suffered somewhat from dyspepsia.

Causes.

The exciting causes, are over exertion of the organ, the influence of bright light, and exposure

to cold and damp. I have seen a few instances, in which slight injury appeared to produce the morbid action—but I have known the disease to commence, without being able to detect any particular cause, as immediately exciting it.

The first endeavour should be to do away with Treatment. the exciting cause, and then the predisposing cause should be attacked and subdued, if possible; I say, if possible, because I regret to state, that it is often beyond the reach of our limited science and art, inasmuch as it arises from mental influence: but although we cannot entirely subdue, we may frequently mitigate this unfavorable state, which promotes the progress of the local disease.

First, then, the patient should be taken from an employment which requires much ocular or mental exertion, and he should be guarded from exposure to bright lights, and from the influence of sudden changes of temperature; and by degrees, perhaps, he may be induced to engage in some business or employment which may amuse, but not fatigue, and serve to occupy the mind sufficiently to exclude distressing thoughts.

Secondly, — dietetic and medicinal means should be employed to correct error in any important function, and, at the same time, to sup-

port the general strength, and equalize vascular and nervous power.

Persons subject to this disease very rarely require depletory measures, as it nearly always arises during a depressed or irregular state of the circulation. If there be symptoms sufficient to warrant the loss of blood generally, it should be abstracted with great caution.

Local bleeding by leeches, or the use of the cupping-glass, may now and then be serviceable. When there is much continued local pain, or fullness, the relief obtained, not only from suffering, but also as regards vision, is sometimes considerable, after the removal of a small quantity of blood ; and, in consequence, the remedy is often abused, being repeated so frequently as to act injuriously on the constitutional power.

It is generally considered necessary, in the treatment of this disease, to follow up the antiphlogistic plan of treatment in its strictest sense ; and this, I am satisfied, is the most injudicious course that can be pursued ; for where it may do good in one case, it will do mischief in at least a dozen. The disease cannot be arrested or cured by loss of blood ; the only good which can be effected by it, in my opinion, is to lessen the tension of vessels, so as to retard the disorganizing process, and gain time for the operation of other remedies.

Mercury, when properly employed, I consider to be a much more powerful and serviceable agent in relieving this disease than bleeding, and equally dangerous as bleeding, when used indiscriminately. It may first be given with some drastic purgative, and followed by an alkaline saline aperient, to carry off all matter accumulated in the intestinal canal; and afterwards it may be administered with a narcotic, in a form and dose, and with a frequency, adapted to the condition, or ordinary character of the mucous membrane, and also to the power of the patient: at the same time, general power must be maintained by a simple nutritious plan of diet, and such allowance of stimulus, as the previous habits of the patient may require;—for those much accustomed to stimulating drinks are rarely able to combat disease, if altogether deprived of that, which they have become habituated to.

When the local symptoms of fulness or pain are not continued or severe, they are best remedied by counter-irritation—as repeated blisters, or mustard plasters, so as not to vesicate; or the use of tartar emetic ointment: I think these remedies act most beneficially, when applied over the expansion of the supra-orbital vessels and nerves.

Sometimes the circum-orbital pains are of a

neuralgic kind; and when so, may be often mitigated or subdued, by the application of a narcotic plaster to the forehead—as equal parts of opium and frankincense plaster, with a small portion of extract of belladonna, spread on soft thin white leather.

The first object of treatment, viz., the arrest of the disease, may then be effected by local bleeding, by acting on the more important secretions, and by mild mercurial influence.

The second object, viz., subduing the diseased action, is to be effected by a careful continuance of the local and general medicinal means described: but during the whole period of treatment, it is necessary to insist on a regular, plain, and nutritious diet, moderate exercise, warm clothing, perfect rest of the organ, and, as far as possible, mental relaxation and quietude.

When all appearance of diseased action is gone, there is often much to do to place the patient in a state of safety. There is liability to relapse, or to the occurrence of fresh inflammation, from trivial causes, so long as the circulation is of feeble nature, and the balance of vascular action and nervous power unequal.

The patient should, therefore, be kept under observance, and made to continue a regular plan of diet and exercise, such as will tend to increase and maintain general power; and, at the same

time, a mild alterative course should be adopted to correct error in secretion, and improve the condition of the circulation. All mental excitement should be most carefully avoided.

Any return of uneasiness, or symptom of congestion of the eye, should be immediately met by the application of a mustard poultice, or a small blister ; and, should any of the conjunctival vessels remain enlarged and filled with red blood, a weak solution of acetate or sulphate of zinc should be applied, once or twice a day, to promote their contraction.

A pure air and moderate exercise will materially contribute to establish a cure.

OF ACUTE RETINITIS OR GLAUCOMA.

Symptoms.

SUDDEN occurrence of severe pain, throbbing and dartings, at first, principally in the eyeball, but soon extending to the brain; and coming on in paroxysms: great sense of fulness and tension of the globe, with excessive tenderness, much intolerance of light in the commencement, with frequent flashes of vivid, redish, or orange colored light, or frequent scintillations, even when all day light is excluded; and, usually, more so at night, or when the patient is recumbent and the head low: the suffering increased by any sudden movement of the eye, which also produces flashings or sparks; the lachrymal secretions usually superabundant, flowing over the cheek, and of a hot or scalding quality; now and then, at first, there is a paucity of secretion, and the eye feels stiff; and the motions of the lids difficult.

In a short period from the commencement of the attack, the vision becomes dull and misty, and the density of the mist increases rapidly,

until the perception of the natural light is lost ; whilst, however, the appearance of light clouds, flashes, and sparks remain. In the early stage of the disease, objects appear occasionally tinged with red or orange color, as they sometimes appear in our autumnal evenings. The pain soon extends from the globe to the orbit and its circumference ; being particularly severe at the supra-orbital notch ; it is of a remittent character, and the attacks are usually most severe at evening, or early in the morning, often affecting the head and face, and producing severe hemi-crania, with such a degree of tenderness that the patient cannot bear a night cap, and is unable to rest the affected side upon the pillow.

Throughout, there is a sense of grit or sand in the eye. Soon after the disorganizing process has destroyed the functions of the delicate textures, the suffering suddenly or gradually subsides.

The eyelids are usually spasmodically closed Appearances, on exposure to light, and are often slightly tumid and red ; lachrymation is abundant, in most cases ; and is much increased by examination, or exposure of the eye. The conjunctiva exhibits several large and tortuous vessels distended with purple colored blood, and ramifying from the direction of the attachments of the recti-muscles towards the cornea ; diminishing

in size, but dividing, subdividing, and anastomosing, as they approach the margin of the cornea. Some of the vessels of the sclerotic coat may be also usually seen injected with red blood, but of lighter color, and of duller appearance than those of the conjunctiva, and small and straight in their courses.

At a very early period the iris loses its brilliancy, and becomes discolored and dirty in aspect; the pupil is, in the first instance, usually much contracted, but in a very short time becomes dilated, and irregular, or oblong, instead of round; the dilatation is usually greatest in a direction upwards and inwards, sometimes upwards; now and then the elongation is horizontal, and, in a very few cases, I have observed it to take place downwards; the motions of the iris are always very sluggish, and are generally lost before the sensibility of the retina is destroyed—the blackness and brightness of the pupil is soon disturbed, it becomes dull, and usually acquires a greenish aspect, with the appearance of an opaque spot, which varies its position according to the incidence of the rays of light—(as in the chronic disease.) The globe feels tense and inelastic.

In the last stage of the disease, the general redness of the eye diminishes, the vessels of the conjunctiva and sclerotic being less distended

with red blood; but the principal vessels of the former become larger, more tortuous and of a darker color; the pupil is greatly dilated, oval, and fixed; the opacity of the humors augments, and complete lenticular cataract is formed, which retains, however, in nearly all instances, a greenish tinge.

All these changes are effected, sometimes, in forty-eight hours, or less, and seldom require more than four or five days for their completion, if the disease be allowed to run its course.

There is usually much constitutional disturbance, the patient is restless and watchful, the surface of the body and of the extremities is unusually hot and dry; the face flushed, and the pulse quick and sharp in beat; in some instances hard and wiry, but in most cases, easily compressible, evincing indifferent power; the tongue is generally loaded, the mouth parched, and there is frequently nausea, with much thirst: these general symptoms are augmented towards evening, or when the local suffering is most severe.

The predisposing, as well as the direct causes of the acute disease are similar to those which I have mentioned as tending to produce the chronic affection. In the history of these cases, it is usually found, that the patient has been

complaining, or has been observed by those immediately about him to have been unwell, and out of spirits, for some time previous to the burst of retinal inflammation.

The most rapidly destructive and distressing cases, that I have witnessed, have occurred during great mental anxiety or distress: as in the elderly female, from the loss of husband or child, or near and dear relative and companion; and in the male, from sudden loss of property or comfort, in consequence of imprudent speculations, or from the deceit of one previously esteemed and valued.

The acute form of retinitis is frequently preceded by the chronic stage; the former being excited by violence, or exposure, or some sudden mental emotion. Persons having a gouty diathesis are more especially liable to this disease.

Prognosis.

Is always unfavorable; in the majority of instances the acute disease makes such rapid progress, that the surgeon has not time to apply his remedies to prevent the disorganizing process; and, in those cases, in which he has opportunity to use his remedies, and even succeeds in arresting the disease so as to preserve a useful degree of vision, the patient is subject to relapse, from such trivial causes, that vision is seldom retained for more than a few months; fresh at-

tacks of inflammation soon complete the organic change which destroys the functions of the retina.

This formidable disease is very rarely met with ^{Persons} in persons under the middle period of life ; it is ^{liable to.} most frequent between the ages of forty-five and sixty, though occasionally seen in persons of more advanced age. It is more common in females than in males, and is almost confined to persons having dark irides ; I have, however, seen exceptions. It is, indeed, most frequent in those who possess a sanguine temperament, (who usually have dark complexions,) and, probably, in consequence of their proneness to mental disturbance, and irregularity of circulation ; but it now and then occurs in those who have a large and soft frame, with indolent circulation, but much nervous irritability.

It attacks, sometimes, one eye first, but most frequently both together, or within a very short period of each other ; and it usually runs through its course with greater rapidity in one eye, than in the other. When it appears in one eye only, the second will, probably, become affected, unless great care be taken.

Although acute retinitis occasions such rapid ^{Treatment.} disorganization, (by implicating other textures,) and annihilates the function of the organ frequently in a few hours ; yet, in some cases, the

disease may be checked, and a useful degree of vision be preserved, for months, or perhaps, years ; and when one eye only is affected, the preservation of the other greatly depends upon careful management.

The best and most powerful agents to arrest the disorganizing action, and to lessen and relieve suffering, are bleeding, mercury, and narcotics ; but care and judgment are necessary in their employment, or more evil than good will result, especially, from the two former.

Persons attacked with this disease, usually, have the force of vascular action below par, and the nervous energy depressed ; general abstraction of blood is, therefore, not only unnecessary, but likely to produce injury ; it should never be resorted to whilst the pulse is easily compressible ; but only when it is hard and incompressible ; and even then very cautiously. Even local bleeding by cupping-glass, or by leeches, must be carefully effected when the circulation is depressed and feeble, or the effects may be very prejudicial : unfortunately, the loss of blood, generally, or locally, often mitigates suffering for a time, and, therefore, the patient is induced to solicit a repetition of it, and too often, the medical attendant, ignorant of its baneful tendency, follows up the deceptive plan of treatment. I have seen many cases, in which excess of deple-

tory means has prevented a chance of saving any degree of vision—by inducing a condition of general power, inadequate to promote a healthy local action.

83. A gentleman, highly talented and edu- Case.
 cated, about sixty-three years of age, and of anxious temperament, was brought to me from the country, having been the subject of acute retinitis in both eyes; the attack had commenced when he was exhausted by much mental anxiety combined with bodily exertion; the symptoms of the disease had not been very severe, although well marked at first, and had yielded, in great measure, to moderate depletory measures, and entire relaxation of mind and body; a renewal of his duties, to a very trifling extent, caused relapse; and depletion was again resorted to; he experienced relief from suffering whenever blood was taken away generally and locally; but his vision became more disturbed, and the attacks of pain more frequent and severe, as his constitutional powers became depressed; and he was brought to London in a very feeble state, and with very little visual power remaining: the process of disorganization had not extended to the vitreous body, or to the crystalline lens; nor was any change perceptible in the retina; but we could not restore power rapidly enough, to prevent the organic changes from taking place.

Case.

84. Very lately I saw a lady in whom the disease had commenced during mental depression, from severe domestic affliction; she was also above sixty years of age, and did not possess much power naturally: at first much relief was obtained by depletion, which led to the continuance of such means, as reduced her to a state of feebleness, under which the local disease produced disorganization, in spite of all my endeavours to arrest it.

If, then, the pulse be full and incompressible, sufficient blood should be taken from the arm to lessen the tension of the arteries, and diminish the force of the heart's action; but, otherwise, blood should only be abstracted, locally, by leeches applied on the surfaces of the palpebræ, or be taken by a cupping-glass, from the temple or from behind the ear; the latter position I usually prefer, in consequence of the cranial tenderness and pain, which, generally, extends to the forehead and temple.

At the same time, it is right to produce free action from the bowels, &c.; by some mercurial and drastic purgative combined, preparatory to the exhibition of mercury in combination with a narcotic, in form and dose according to the strength and peculiarities of the patient—the object being to promote mercurial action without occasioning depression: it is frequently useful to

add some diaphoretic to the dose of mercury and opium : thus the compound powder of ipecacuan usually acts better than opium itself.

The power should be maintained by a simple nutritious plan of diet, and it is even advisable, sometimes, to allow a small quantity of stimulus to those who have been previously much accustomed to its use. The dietetic means are the best and surest to sustain a proper degree of vigour.

Blistering freely, on the nape of the neck, or behind the ear, is often serviceable in the early part of treatment ; but I have generally observed that the application of such means to the temple or forehead is not productive of much good, and often appears to aggravate the symptoms, especially at first, before the surface discharges freely.

Much relief is generally procured by gentle friction with blue ointment and opium, over the eyebrow and to the temple, and, in this way, mercurial action may be aided, in cases in which the internal use of the remedy is difficult, from an irritable state of bowel.

All the means recommended for the relief of the chronic disease are also applicable to the management of the acute form ; only it is required that they should be more actively employed.

Here, again I regret to say that all our efforts

are often unavailing, from our being unable to “minister to the mind diseased,” which so frequently predisposes to the disease, and maintains a condition of system which resists all the means our science and art at present afford.

Case.

85. A man, aged fifty-seven, a tailor, of dark complexion, of anxious disposition, and subject to gout, was suddenly attacked with pain in the right eye, extending to the head: it was of a shooting character, and severe, but of short duration: this was immediately followed by dimness of vision, and appearance of sparks, and a luminous ring of a deep red color: these symptoms however gradually subsided, without any particular medical treatment; he merely took two or three doses of aperient medicine, was moderate in his diet, and refrained from much exercise of the eyes. About a month afterwards, whilst still living carefully, and not exercising his trade, he had another similar attack which alarmed him, and he sought medical advice. This occurred in the month of July; he was advised to live very low, without solid animal food, he was cupped, blistered, and leeches repeatedly, active aperients were administered, and he was affected with mercury: nevertheless, the dimness of vision augmented; he became subject to dull circum-orbital pains, especially about the supra-orbital notch; he was annoyed by frequent flashings of

light in the eye, and the continuance of the red luminous ring. The eyeball felt tense, and was rather tender to the touch ; there was little variation in these symptoms, till the following Christmas, when he lost the perception of light with the eye ; after which he had much less pain, and the appearance of flashes, &c., was less frequent and vivid. He had been much reduced by the treatment, but rallied in the course of a few weeks, after he left off his medicines, &c., and took a more generous though moderate diet. Early in the succeeding summer he experienced symptoms of the same kind, in the left eye, and on the left side of the head—they were altogether however, more severe ; the vision was affected to a greater degree than had occurred in the right ; the pain was greater and more continued, and the luminous appearances more vivid : he had also more decided symptoms of inflammation in the organ, indicated by redness, and profuse secretion. After a short trial of the antiphlogistic means, under which the symptoms augmented, he applied at the Ophthalmic Hospital about the end of August. When I examined his eyes, I found the right globe unusually hard and inelastic ; a few large and tortuous conjunctival vessels preternaturally distended with dark red blood ; the iris dull and slightly discolored ; the pupil

dilated, oblong in figure, being drawn upwards, and inwards, and fixed; a dull spot of a dirty green color was apparent in the pupil, but not fixed, varying its position according to the incidence of the rays of light; the lens was clear, but the vitreous body slightly turbid; not sufficiently so, however, to account for the loss of vision. The left eye presented similar appearances, though not so strongly marked; the iris being less dull, the pupil less dilated, and the dull spot in the pupil less dense; there were, however, more signs of inflammatory action in the conjunctiva and sclerotic, both of which exhibited many vessels filled with red blood. He still retained sufficient vision to discern large objects, and to guide himself with tolerable accuracy, but he complained of a constant thick mist before the eye; his general health was very much impaired, and his mental distress and anxiety very great. I ordered him to take a plain nutritious diet; and prescribed a mild alterative and tonic plan of treatment. This soon mitigated his suffering, and somewhat improved his general health; but had little influence upon his mental distress, which principally arose from the conviction that he would lose his sight. For a short time, the diseased action appeared to be checked, when he became affected by cold, with

slight fever ; in consequence of which the ocular disease recurred, and the vision became much further obscured. From this period, our attempts to subdue the disorganizing process were un-availing. The pupil of the left eye became gradually more dilated, the opaque spot in the pupil augmented, and assumed a deeper tinge of green ; that of the right eye also increased, the vitreous body gradually became more opaque ; and, eventually, the lenses lost their transparency, and cataracts ensued, having a dull and dusky green color. In about six or seven months, subsequent to his application at the institution, these organic changes were completed, and he was perfectly amaurotic ; but continued to suffer from occasional ocular and circum-orbital pains, during sudden changes of weather, or on disturbance of the general health ; and had frequent appearances of light clouds passing before the eyes, and a silvery flickering light.

This case afforded to me the best evidence of the course of the disease, termed glaucoma. First, pains, flashes, sparks, and dulness of vision indicated affection of the retina ; next, the dull green spot, and subsequent turbidity, evinced a change in the vitreous body ; and, lastly, the formation of cataract proved the extension of disease to the crystalline lens. The slight change in the iris was subsequent to, and I

believe consequent upon, the affection of the retina; for the alteration in this membrane was at variance with the changes which we so frequently observe, as the result of inflammation of its texture.

OF SCROFULOUS AND MALIGNANT DISEASE
OF THE RETINA OR OPTIC NERVE.

I AM compelled, at present, to place together that which is usually considered as a scrofulous affection of the retina, and that which proceeds to the development of true fungus hæmatoides, from inability to point out any signs by which the two diseases can be distinguished, in the early stages ; and also from the conviction, (which has arisen from some cases which I shall relate,) that the two are sometimes similar in origin, and that that which is at first simple, may, subsequently, become malignant.

Fungus. Fungus hæmatoides,—spongoid tumor, —medullary sarcoma,—soft cancer. Synonyme.

This disease most frequently appears at an Symptoms. early period of life, before the patient is capable of describing his sensations.

In the adult, the commencement is marked by scintillations, and obscurity of vision, such as indicate chronic retinitis, without, however, the pain or uneasiness, (ocular or circum-orbital,) or

change in the condition of the pupil; and it is not until the disease is much advanced, that suffering commences: the symptoms then are similar to those which occur in acute retinitis.

Appearances.

At first, a brilliant yellow color pervades the pupil, which is only perceptible under particular circumstances of the incidence and reflection of light from the patient's eye, whilst he is at a short distance from the observer, but which is readily to be distinguished, when the organ is examined closely, in any degree of light. If the pupil be dilated by the influence of belladonna, most frequently a uniform opake deposit can be readily discerned, in the site of the retina, occupying the whole extent brought under view; but, in some cases, the yellow appearance is partial, and the surface of the retina exhibits opake tubercles; whilst, in other parts, the usual dark and brilliant aspect is retained. The morbid deposit, whether uniform or tubercular, presents usually a few, or numerous red spots or lines which, under careful observation, are found to be vessels carrying red blood; they can generally be distinguished by the naked eye; but become, of course, more apparent with the aid of a high magnifying power. If the change does not affect the entire retina, the patient still possesses some degree of vision; otherwise, perfect amaurosis results.

By degrees the deposit augments, sometimes rapidly, more frequently slowly, so that a few weeks, or many months, may elapse before a very marked change is apparent. By attentive observation, however, it may be discovered that the opaque mass augments and approaches the lens, causing absorption of the vitreous body. If the increase be very gradual, the morbid growth may nearly reach the posterior part of the lens, before further change in the textures of the globe occurs; but if it be rapid in augmentation, the vitreous body becomes turbid, and of a dull and dirty yellow, or greenish color, and soon afterwards, the lens loses its transparency, and assumes a similar aspect; at the same time, the pupil dilates, the iris becomes dull and discolored, and is pushed forward by the diseased mass, until the chambers for the aqueous fluid are destroyed, the fluid being absorbed: during the progress of these alterations in the vitreous body, lens, and iris, inflammatory action takes place in the other textures of the organ, and the vessels of the conjunctiva and sclerotic are filled with red blood; profuse lachrymation takes place; the patient shuns the light; the globe becomes excessively tender and tense to the feel; and severe ocular and circum-orbital pains occur: the palpebræ, also, usually become

tumid and red ; and the superficial veins appear enlarged, and fully distended with blood of a dark color.

Soon after these symptoms are established, the globe begins to enlarge ; usually, there is a uniform increase ; but, occasionally, it is partial, and an irregular projection or projections are formed. When the enlargement of the globe is evident, the severity of the ocular and circum-orbital pains is generally much mitigated, though they frequently recur, so as to produce much distress ; it appears that the suffering is most excessive, whilst the pressure is the greatest ; and whilst the diseased growth is confined, by the unyielding and firm sclerotic tunic,—if we judge from the relief which is obtained when this texture gives way. If the action be malignant, the progress of the disease is generally very rapid, from the state just described : the tunics are ruptured, or yield to the pressure from within ; and the fungoid mass shoots forth ; and the patient soon sinks under the repeated loss of blood which takes place from the diseased mass.

Such is not, however, the constant termination of the malignant disease ; for, in some instances, before the projection of any fungus from the globe, the patient is seized with symp-

toms of cerebral disturbance, evinced by convulsions, by stupor, by coma, &c. ; and life is destroyed by organic cerebral changes.

We are unable to assign any.

Causes.

Seldom a year passes in which I do not see, at least, three or four of these cases ; and of those which have come under my observation, certainly nineteen out of twenty have been in young children, mostly in infants.

Persons
liable to.

From witnessing the beneficial effects of the action of mercury in inflammatory affection producing a deposit of fibrin, the observant medical man could hardly fail to employ it, with a view to check and destroy the disease now under consideration, which is first evinced, by the effusion of an opaque matter which has the appearance of fibrin. Now, although mercury has not, at present, answered the expectations of many who have tried it, for the cure of this disease of the retina ; yet, I am not aware that any other remedy has effected so much : and I trust that when the administration of that powerful agent is better understood, that this and other formidable diseases may be brought under its control. I must refer to the cases which I shall relate, in justification of the foregoing statement.

Treatment.

86. Master H——, aged three and a half years, was brought up to me from Liverpool, in consequence of disease affecting the left eye.

Case.

Some months before, the parents had observed a brilliant yellow reflection from the pupil of the eye; but the child did not appear to suffer in the slightest degree, either locally or generally, nor was it observed that his vision was imperfect: the yellow appearance gradually increased, and assumed a deeper color, having a redish tinge: the eye became slightly bloodshot; the child seemed to be uneasy; medical advice was then sought for; and the case was treated by anti-phlogistic means, as one of simple ophthalmia: the disease, however, advanced more rapidly; great change took place in the aspect of the organ, and the redness augmented; the globe began to enlarge, and the palpebræ became tumid and discolored, exhibiting numerous enlarged and distended veins. The little patient suffered much; he lost his appetite; the more important secretions became disturbed; and he was greatly depressed, so that all inclination to exercise and play ceased. The child being accidentally seen by a gentleman who had been a pupil at the London Ophthalmic Hospital, he pointed out to the parents the formidable nature of the disease, and induced them to come to town for advice.

When I first saw the patient, he was pallid, depressed in spirits, had a distressed look, and seemed to suffer a good deal from local pain:

the palpebræ of the left eye were much swollen, discolored, and loaded with dark distended veins; they were protruded by the globe, which had acquired a bulk more than half the size beyond its natural extent; and such increase was nearly uniform—there being no particular projecting point: the vessels of the conjunctiva were fully distended with dark red blood, being large and tortuous; and numerous small straight vessels could also be traced in the sclerotic, of a lighter red color, but of duller aspect: the cornea was hazy; and only a confused mass could be discerned beneath,—all distinction of iris, lens, &c., being destroyed: the globe was hard, inelastic, and very tender to the touch. Dr. Farre saw the case in consultation with me, and the mild mercurial plan of treatment was decided upon, with a sustaining diet, &c.: and, for the purpose of effecting this, the child was placed in the neighbourhood of Pentonville; and, fortunately, under the care of a relative, a lady of excellent judgment and intelligence, so that our advice was most strictly attended to. First, the bowels were freely emptied, and the secretions carefully looked to, and a simple light diet, principally of farinaceous matter and milk, was given: a leech or two was applied to the palpebra when the pain became severe, and some blue ointment, combined with

opium, was rubbed on the forehead, over the eyebrow and upon the temple, every evening, for several minutes. After two or three days, the child being tranquil, and the secretions in good order, he took one grain of the mercury with chalk, and three grains of compound cinnamon powder every night; and, after a few days, this dose was given, night and morning; the friction with the ointment being continued, and the bowels being regulated by small doses of infusion of senna and manna. By degrees, the dose of mercurial was augmented, and, at the same time, the diet was also increased, by the addition of plain animal food, principally mutton, and well boiled simple vegetables.

About five weeks from the commencement of the treatment, the little patient was taking three grains of mercury with chalk thrice a day, and was allowed a good meal of solid animal food, once in the twenty-four hours. Within the first fortnight of the treatment, the little boy became cheerful, and was free from suffering: he played about as usual, and the use of leeches was abandoned; in the same period, the tumefaction and vascular condition of the palpebræ subsided; and some diminution took place in the distension of the vessels of the conjunctiva and sclerotic tunics; but the globe remained enlarged and tense, although the tenderness was lessened.

After taking the mercurial thrice a day, for a few days, in doses of three grains, the gums became rather swollen and florid; but there did not seem to be any tenderness of the mouth, as mastication was performed without any difficulty or complaint; the dose was, however, lessened, and continued in such quantity as to maintain a slightly tumid condition of the gums.

Up to this period, the only evident change in the eye had been in the diminution of its vascularity; but it now lost the feel of extreme tension; and the child could bear moderate pressure upon it, as well as he could upon the other: soon afterwards, about the seventh or eighth week, there was a sensible diminution of the globe, yet the conjunctiva and sclerotic both continued to exhibit more vascularity than natural. The very strict attention which had been given to the diet, to the exercise out of doors, to the clothing, and to the condition of the secretions, had enabled us to pursue the course without any material interruption; and to this is perhaps, in great measure, to be attributed the beneficial operation of the remedy.

From time to time, the dose of the mercury with chalk was further lessened, as we found that a smaller quantity sufficed to keep up the effect we desired upon the gums; and the diseased mass continued gradually to subside: with

slight modification only, the same plan of treatment was steadily pursued for nearly six months, when the globe had shrunk to about one-fourth of its natural size, and appeared to be perfectly quiet, and free from morbid action.

During the treatment, the child's general health had become robust, and he was much increased in stature and bulk. The little patient was then allowed to return home, with the conviction that he was safe from malignant affection; but I sent with him, written regulations for diet, exercise, &c., &c., which I earnestly urged the adoption of, for at least twelve months. Before, however, the expiration of twelve months, I heard, accidentally, that the poor little fellow was in a dying state from fungus of the eye, and through the kindness of the gentleman who had first discovered the character of the disease, I subsequently obtained the following particulars.

That soon after his arrival at home, the regulations, which I had been at much trouble to draw up, had been entirely laid aside; and that the boy had been indulged in every way that a fond, but foolish mother could devise: that, in consequence, his general health became deranged, and the shrunken globe became irritable and painful, and began to enlarge again; that little or nothing was done, because the mother was

averse to further medical treatment ; consequently, the progress of the disease was rapid, and, after a few months from the renewal of the diseased action in the globe of the left eye, true malignant fungus was developed, and destroyed the child.

This case is one of the highest interest and Remarks. importance, as shewing, either that a purely scrofulous or simple disease may assume a malignant action, or that malignant disease may be checked and subdued, by careful treatment. Of the first position I have no doubt in my own mind, having, in general surgery, seen many cases in which malignant action has supervened, after simple morbid action has been induced, and has effected some structural change ; which has, however, remained inoffensive and inactive for months or years ; and, in these cases, the development of malignant disease has always been coeval with a marked derangement of the general health, or the disturbance of some highly important function. Perhaps, most or many of the diseases which assume a malignant character have a simple origin, and early attention might, in many instances, prevent the development of malignant action.

I am more disposed to favor such an opinion, rather than to sanction the second position that I have advanced—viz., that malignant disease

may be subdued by medical or surgical treatment ; though there are several circumstances which might be adduced in support of this opinion. Until, however, we can point out, distinctly, the differences between simple and malignant diseases, these questions must remain undecided ; but, nevertheless, I trust that our best exertions will be continued to combat and conquer both.

Case.

87. A fine healthy looking child, a boy, aged seven months, was placed under my care, having disease of the left eye, which exhibited a brilliant deep yellow colored pupil, and this resulted from a deposition in the position of the retina, which, on close inspection, (especially, when the pupil was fully dilated by the effect of belladonna,) appeared somewhat irregular, or tubercular, and well organized with red blood ; as numerous red vessels could be distinguished on the surface of the morbid growth. The child had been seen by many eminent physicians and surgeons, and all had expressed the same opinion, deciding the disease to be of a malignant kind. Although the highly vascular appearance of the disease induced me to form an unfavorable opinion of it, I thought it right to try every means in my power to save the little patient, who appeared to be particularly healthy and strong.

As the mother could not nurse him, a wet-

nurse was provided, and the little patient and his nurse were placed in comfortable apartments, on the high ground near Islington; and the entire management of the case being left to me, I began the treatment by giving half a grain of mercury with chalk, and two grains of compound cinnamon powder, twice a day; but after a few doses had been taken, I substituted prepared chalk powder, for the cinnamon, which was offensive to the child; the bowels were regulated by castor oil, and, at first, his food was solely derived from the breast, from which he had a plentiful supply. By degrees, the dose of the mercurial was augmented, by making a trifling addition, every five or six days; as the disease in the eye evidently increased, though the progress was extremely slow. Several months elapsed, and the child continued well and healthy: dentition commenced, and proceeded favorably and rapidly, though, occasionally, it induced some general disturbance, and derangement of bowels, which compelled me to interrupt, now and then, the steady use of the mercury. After the appearance of a few teeth, the child was allowed a small portion of finely chopped meat, or some broth, every other day, but it principally subsisted on his nurse. During this period, the ocular affection advanced, so that the vitreous body and lens became disorganized, and, after a

short time, the iris also was involved in the diseased action; but the child did not suffer; and his general development proceeded as well as in any child that I have seen. About twelve months from the commencement of the treatment, the changes which I have described were effected in the eye; and, with the exceptions I have named, the remedy had been regularly persevered in, and the dose had been augmented to three grains of mercury with chalk, and this was given thrice in each day. I had also on a few occasions lessened the dose, when the child appeared depressed or irritable, independent of any disordered state of the bowels. As dentition advanced, animal food was given more freely and more frequently, but never more than once in the day.

The continuance of the treatment, for a year, had not then effected more than retarding the growth of the disease; nor had it, in any respect, interfered with the comfort or development of the patient; I determined, therefore, to persevere. We went on, for a few weeks, without any apparent change in the organ, when the mother, who had recovered from her second confinement, came to stay in London, and, unfortunately, interfered with the management of the patient; gastric derangement and an irregular condition of the bowels, were induced, principally, by over-

feeding the child ; and now, for the first time, the eye became red and painful ; this was, however, soon remedied by lessening the diet, and giving an active purge, and, at the same time two leeches were applied to the lower eyelid. After this, the case again proceeded, with little alteration, for several weeks, excepting that some slight enlargement of the globe took place ; the vessels of the conjunctiva became, occasionally, injected with red blood, but the patient did not complain of pain ; and the local symptoms were not such as to require the use of leeches.

In consequence of some disagreement between the mother of the boy, and the nurse, the latter quitted her situation, and the little patient was removed from town, to be placed under the eye of the mother, a new nurse being provided ; and this was done in spite of my solicitation that he should remain under my care. Soon after the patient had been removed from London another attack of pain and slight inflammation of the eye occurred ; and, in a short period, three or four more of these relapses took place : I saw the child on each attack, and always found it had been induced by negligence in the diet, or over-indulgence, which had occasioned disorder of stomach, or bowels, and thus created much general disturbance. The repetition of these attacks, and the evident enlargement of the globe

which had, at the same time, occurred, induced me to entreat that the little boy should be again placed in London, so that I could watch him carefully : with some difficulty the mother yielded to my importunity, and also consented to place him with the nurse who had had the charge of him at first, and who was, fortunately, disengaged.

Now, again, we proceeded favorably, (although we had frequent visits from the mother,) as the nurse had prudence and firmness enough to prevent any infringement of the regulations ; the general health of the patient, which had somewhat suffered, was soon reinstated, under the plan of regular diet, and exercise ; and we were able steadily to go on with the mercurial—the eye became quite tranquil, and free from vessels injected with red blood ; the enlargement of the globe, at this time, was about one-fourth more than the natural size ; and most evident when the child was asleep, from the protrusion of the eyelids.

In the course of a few weeks I began to perceive a diminution of the globe, which proceeded very gradually ; whilst the health, strength, and development of the boy was as favorable as could be desired : dentition was nearly completed ; he had learned to walk, and talk, and had become a very engaging and fine child. I kept

him in town a few months, until we could not detect any difference in the prominence of the eyelids during sleep; and were of course satisfied of the diminution of the eye; and I then yielded to the solicitations of the mother, and the boy was removed to the country; he had not had any relapse of importance during his stay in town; and for several weeks before he left, no sign of uneasiness or symptom of increased action in the eyeball had occurred.

His nurse went with him to the country, and for several weeks I had favorable reports; the medicinal and general plan of treatment was steadily proceeded with, and a little further diminution of the globe took place.

Again disagreement occurred between the mother of the patient and the nurse, principally, in consequence of the former wishing to indulge the child much more than I had directed; and the nurse again left; and I was unable to effect a reconciliation which I was most anxious to do, from the excellent conduct of the nurse, and her very great care and attention in the management of the boy. The evils of indulgence and bad management became again soon manifest; first, in disorder of stomach and bowels; then by fresh disturbance, pain, and redness of the affected eye: these attacks were, at first, easily subdued as formerly; and during the alarm cre-

ated by them, greater care and strict attention to my directions were promised ; but seldom adhered to for many days after the little fellow became free from suffering. By degrees, the relapses were more frequent, and more difficult to subdue ; the general health of the boy became much deranged, the eye began again to enlarge, and many vessels of the conjunctiva and sclerotic were permanently filled with red blood.

I could not again persuade the mother to let the child come to town to be watched by me ; and being nearly forty miles from London, I could not undertake to see it often. Under these circumstances, I gave up all hope of a favorable result, being aware that only the most attentive and cautious management could afford a chance of creating a beneficial change in the case ; and being satisfied, from previous experience, that no regular plan would be pursued, without the superintendence of a watchful and firm person. My worst anticipations were soon realized : as the child became weaker and more fretful, it was the more indulged ; its general health declined ; the eye enlarged rapidly, and produced almost constant distress ; the enlargement was nearly uniform, and the vessels of the globe and of the eyelids became distended with dark purple blood.

When the globe had acquired the magnitude

of a large egg, symptoms of cerebral mischief supervened ; and, after several days of severe suffering, the poor little fellow sunk into a comatose state, which soon terminated in death.

88. A married lady, who had had a large Case, family, and had passed the middle period of life, came from Cirencester to consult me in consequence of disease in her left eye, which had destroyed her sight. On examining the organ, my attention was immediately attracted to the condition of the pupil, which was much dilated and motionless, and through which a deep yellow colored deposit was apparent. On close inspection, this deposit was observed to be posterior to the vitreous body, as if placed on the inner surface of the retina : it was unequal, or slightly tubercular, and numerous red points and some very minute vessels could be detected upon its surface : the iris was dull and discolored ; many of the vessels of the conjunctiva and sclerotic were filled with red blood ; the globe felt tense and was tender, and she complained of a dull aching pain in it, and above the eyebrow, with occasional shooting from the back of the eye to the head. Her general aspect was unhealthy ; she was very corpulent, and the muscular fibre was soft and flaccid : her face was pale and rather sallow ; her pulse was full, but very compressible : she was easily fatigued, and suffered

from irregularity in the functions of the bowels ; and had a very indifferent appetite. All uterine action had ceased for some time. As she was nervous, and mentally depressed, I thought it most prudent that she should pursue the treatment, I wished her to adopt, at home ; where she would be surrounded by her family, and where I knew she could have the superintendence and assistance of an intelligent medical man. I, therefore, wrote to this medical gentleman, and requested him to see the following plan carried into effect.

To unload the bowels by one or two doses of calomel followed by a black draught : to allow her diet to consist of a very moderate portion of solid animal food, once a day, with a little weak brandy and water ; otherwise, principally to take farinaceous food and milk : as soon as the tongue became tolerably clean, to give her two grains of mercury with chalk, night and morning, and to combine it with some absorbent, or narcotic, if it produced a purgative effect ; and, in case of depression or debility from mercurial influence, to give beside, some cascarilla with ammonia, or any mild tonic and stimulant that he might think appropriate : to have some blue ointment with opium, rubbed upon the forehead and temple, for ten or twelve minutes, night and morning ; to apply three or four leeches to the lower eyelid, in case of any

sudden accession of pain; to let her bathe the eye, occasionally, with tepid water; and to keep her as much as possible quiet in body and mind.

I expressed to him that my object was to establish, gradually but fully, mercurial action; but, at the same time, to promote and maintain an adequate degree of general power, by strict attention to the secretions, and by a nutritious diet, with the aid of such general and medicinal stimuli as might be required.

I have to offer my best thanks to Dr. Gruggen, for his faithful attention to my directions, and for the judicious manner in which he conducted the treatment.

The operation of the treatment was most satisfactory. The general health of the patient improved very much, under the influence of the mercury, of which the effects were fully established in a few weeks, so that the gums became spongy and tender, the tongue swollen, and the discharge of the saliva very copious; yet her secretions were good, and she took sufficient food, in a soft state, to maintain the requisite degree of power.

The local disease gradually subsided; the opaque deposit slowly disappeared, and all evidence of inflammatory action ceased. The course was continued through several months, until the eye had become perfectly tranquil, and free from

the deep seated opaque matter which had been the principal cause of alarm. The treatment was then gradually abandoned, but she continued to live very carefully and quietly : some years have since elapsed, and there has not been any tendency to a renewal of morbid action in the eye, which remains amaurotic, and somewhat shrunk.

Case.

89. A lady, aged thirty-three, who had been married about twelve years, and had borne one child in the first year after marriage, but who had not since been pregnant, consulted a physician of eminence, in consequence of the loss of vision of one eye : on examining the affected organ, a dense and brilliant yellow deposit was perceived through the pupil occupying the posterior part of the globe, as if connected with the retina or choroid ; the morbid deposit appeared to be considerably organized, vessels carrying red blood being distinct on its surface. The general health of the patient seemed good, there being no important functional derangement ; but still there was a deficiency of general energy. The physician consulted had great experience in ophthalmic diseases ; and this experience excited his most serious apprehensions respecting the case of this lady ; for nearly all the cases of the kind, which had come under his observation, had terminated fatally, by development of fungus, in spite of every care and attention : he,

therefore, requested that he might have the advantage of consultation with a surgeon of the highest repute, who had seen more of malignant disease than most others. The opinion, thus obtained, was unfavorable; and it was decided, at the time, that the best chance of saving the patient, would be to extirpate the globe; and the propriety of an operation was confirmed, by another surgeon, who had been long engaged in ophthalmic practice. The patient begged a delay of a fortnight; being, however, willing to submit to the decision of her medical advisers; and, it being considered that the delay requested would not be injurious, the operation was postponed for two weeks. In the mean time, the physician who had first seen the case, having further considered it, became desirous of giving a fair trial to the influence of mercury, which he had frequently employed, with great success, in the treatment of many local diseases; especially such as were attended with deposit of fibrinous, or somewhat similar matter: indeed, he has done much to prove that this powerful remedy has a much greater influence, as a curative agent, than was supposed a few years since.

On the day appointed for the operation, this gentleman, therefore, expressed his wish, that the patient should be submitted to a mercurial course; and his wish was complied with. The

lady was placed under the care of an intelligent general practitioner, who was desired to keep the principal secretions in good order ; to maintain a good degree of general power by diet ; and to employ mercury by friction, so as to establish mercurial action to such an extent as the patient could bear. The effect of the remedy was soon evinced, and a full degree of salivation was produced ; and this was kept up for a period of near four months ; at the expiration of this period, it was evident that the disease had not advanced ; although there was no apparent diminution. This decided arrest of the morbid action induced the physician to solicit a further continuance of the mercurial treatment, to which the surgeons reluctantly consented. A change was made in the mode of administering the remedy, and small doses of the bichloride of mercury were prescribed, and the friction with the ointment laid aside. After a short time, a slight change was perceptible in the diseased eye, the vascularity becoming lessened ; soon after, the globe lost its tension, and by degrees became softer and softer, and, eventually, shrunk ; the diseased mass, and humors of the globe became absorbed, and the tunics collapsed, in two months. The patient had not suffered from the treatment, but, on the contrary, was improved in appearance, and in general energy. A further

proof of the salutary influence of the treatment, on her system, was evinced in her soon becoming pregnant, after having been barren for eleven years.

I have known several other cases in children, in whom the disease has subsided, and the globe has become atrophied, under steady mercurial treatment, with great attention to the condition of the general health ; and, in all cases, the cure has been very gradual : in very few of these cases has a full mercurial influence been established, or has the remedy even affected the mouth ; for it has not been pushed, after a decided change has been perceived in the local disease ; and this has generally taken place, before mercurial action could be detected by the mouth, &c.

I have been told of cases which have terminated in atrophy of the globe, without the aid of mercury, or other powerful agent ; and I believe that such cases do now and then occur ; but that they are rare. The change in the local action and subsidence of the disease, in these instances, probably depends upon some circumstances connected with the general health, not recognized at the time.

Certainly, the majority of these cases terminates fatally : it, therefore, behoves the prudent surgeon to use his best exertions, to arrest and

subdue the disease ; and I know of no plan which offers better prospect of success, than that described in the foregoing cases.

The physician, to whom I am indebted for the particulars of the last case which I have described, considers that the effect of mercury is usually more certain and decided, in proportion as the local disease approaches the state of simple chronic inflammation ; and with this opinion I perfectly agree : but, further, I believe that the deviation from simple chronic inflammation, materially depends upon the condition of general power ; and I am satisfied that the local disease makes most rapid progress, when the general power is much reduced.

The result of removal of the diseased organ, by operation, has been very unsatisfactory ; a very few cases have done well under such treatment ; and, probably, such as have recovered from the operation, might have been cured by the less violent means. Supposing the local action to be malignant, from the beginning, it is probable that the success of treatment, by operation, would be greater, the earlier it might be resorted to ; indeed, judging from the result of operation in children, it affords little or no chance of recovery, when the disease has produced enlargement of the globe. It would, however, in my opinion, be the height of cruelty

and folly, to resort to the extirpation of the eye, when first the morbid appearance is detected ; because it is the most favorable period for operation ; and because a few cases have done well under such circumstances. Experience has proved, that some of these cases undergo spontaneous cure ; and that others yield to careful mercurial treatment ; and that the favorable termination has, thus, far exceeded the result of success from operation.

I cannot, therefore, but express my decided objection to an operation for extirpating the globe, before a full and fair trial be made of the use of mercury ; and fear, that the operation would afford a very indifferent chance of success, should the mercurial treatment fail.

Could we, at the commencement, decide upon the true character of the disease, we might be better able to determine upon the value of the treatment by operation, as regards the malignant affection, which I believe would be found to be very little.

OF THE CAT'S EYE AMAUROSIS.

Definition. Loss of vision, attended by a brilliant metallic appearance, like that observable in the eyes of cats and other animals of the same kind, in particular positions, or under certain modifications of light.

This disease was, I believe, first noticed and described by Beer, of Vienna, by whom it was named.

Until within these last two or three years, I had noticed very few instances of this affection, and considered it to be extremely rare; but, latterly, we have observed, at the Ophthalmic Hospital, that the metallic appearance exists, in a degree, in very many cases of organic amaurosis; but that it is rarely detected, unless, especially sought for; we have perceived it in cases in which amaurosis has been imperfect, as well as in those in which vision has been perfectly lost.

Symptoms. In most instances, in which we have detected this metallic appearance, the patients have ex-

perienced muscæ, and sparks, or flashes, indicating disease of choroid or retina; but, in some cases, the vision has been gradually lost, without peculiar symptom or suffering.

Under particular circumstances as regards the Appearances. incidence of light on the patient's eye, and the position of the observer, a brilliant metallic reflection can be perceived through the pupil, having an appearance resembling the reflection from the concavity of a highly polished metal basin; usually, the reflection has a red tinge, as that from copper; but, occasionally, it has a silvery hue. In most cases, the condition of some of the superficial vessels of the globe, and the aspect of the iris, with the state of the pupil, evince some deep seated disease; but I have seen cases in which I could not detect any deviation from the healthy character of the organ, excepting the appearance under consideration. In all cases, the reflection is not to be observed when the eye is examined under the influence of strong and direct light; or when the organ is closely inspected; and it is only discovered, when the light which falls upon the patient's eye is moderate, and when the person, regarding the eye, is placed at the distance of a few feet from the patient, and in a particular direction. When once the reflection has been detected, it cannot be again observed, unless with considerable

trouble, by placing the patient in a favorable light, and changing position, so as to intercept the reflected rays by one's own eye.

Supposing, therefore, that there be no other evidence of disease, a patient may be seen many times before the character of the affection be detected; this happened in the first case of the kind which I recollect to have seen.

Case.

90. The patient was a boy, about ten years of age, who was brought to the Ophthalmic Hospital, in consequence of having lost his sight. He had rather a vacant aspect, which was the only circumstance I could at first perceive to indicate an amaurotic state; for when I examined his eyes in a strong light, I could not detect any change in texture or function, which would account for the loss of sight.

From the general healthy appearance of the boy, and the apparently perfect condition of the organs of vision, I was induced to suspect the patient of feigning blindness; I did not, however, express my suspicion, but determined to watch the boy. He was brought several times to the hospital, before I discovered the nature of the complaint; and this happened accidentally.

The patient was standing a few feet from me, among other patients, in a situation shaded from the bright and direct light admitted by the window, when I observed a brilliant metallic reflec-

tion from his eyes, such as would arise from a cat's eyes, similarly placed; but upon the boy being brought into a clear bright light, this appearance could no longer be discerned; when, however, he was placed in a shaded part of the room, at a distance of a few feet from me, it became again manifest.

This patient attended, for several months, at the hospital; and a steady mild mercurial treatment was adopted, but without any advantage, or change, in the morbid appearance.

In all the cases which I have seen of this kind, presenting similar characters to that just related, the amaurosis has been perfect and permanent; but I have noticed the metallic reflection in persons suffering from imperfect amaurosis, with other evidence of some organic change; but, in such instances, the appearance has not been so decided or so brilliant.

I consider this disease, or the cause of this appearance, to be seated in the choroid, or between it and the retina; from the close resemblance of it, to that seen in the eyes of the feline tribe, in which we know the reflection to be from the tapetum; and, further, because I believe that a morbid change in the retina, which would give rise to such an appearance, would be easily detected, under a close inspection, in a bright light.

I have, however, preferred giving the description of the disease, in this place, because of its principal feature being somewhat like that, which indicates the commencement of the formidable disease of the retina, just previously treated of.

My present experience does not enable me to recommend any plan of treatment as successful ; I have tried several different remedies, but all have been equally ineffective.

OF INFLAMMATION OF THE GLOBE.

INFLAMMATORY action occasionally takes place in all the tunics of the eye, and in the principal humors, or their membranes.

Severe and continued pain in the eyeball, and Symptoms.
about the orbit, with frequent shootings, which extend to the brain, and produce excruciating suffering; a sense of tension of the globe, as if it would burst, with excessive tenderness, and constant scintillations, or flashings of light. A sense of difficulty in moving the eye, and an aggravation of pain by attempts to move it; secretion from the conjunctiva and lachrymal gland, usually, at first, diminished, and afterwards profuse: after a short time, inflammation extends to the palpebræ, and they become swollen and red. The sufferings are increased when the patient reclines.

Palpebræ swollen and red; the globe appears Appearances.
projected; the vessels of the conjunctiva and sclerotic gorged with red blood, so as to present

a dark red surface; the cornea slightly hazy; the iris dull and discolored; the pupil dilated and irregular, or oblong; the motions of the iris destroyed; the pupil of a muddy and generally dirty green hue; the lens partially or entirely opaque, and occasioning the appearances described in the pupil.

This disease occurs at the same period of life, and under the same circumstances, as acute glaucoma, of which I consider it to be an aggravated and extended form.

The destruction of vision, by this disease, is so rapid and complete, that medical or surgical skill avails little in preventing amaurosis; but the suffering may be mitigated, and the inflammatory action subdued, by the same plan of treatment that I have described, as necessary in acute glaucoma. The suffering is usually protracted, by the use of such remedies, as materially lessen the general power.

LESIONS OF THE RETINA.

SUCH accidents, affecting the retina alone, are extremely rare ; for some other textures of the eye almost invariably suffer, at the same time that the retina is injured.

I have already pointed out how amaurosis occurs from very trivial violence which does not produce any apparent disorganization ; and it may readily be imagined, that more severe injury, which occasions lesion of the retina, should be attended with destruction of its functions ; or that amaurosis should ensue : such is not, however, the constant result of severe injury, as regards the entire retina ; for I have several times found, that the loss of function has been confined to that portion of the retina alone, in which disorganization has been produced by the injury.

91. A gentleman was amusing himself by en- Case.
deavouring to split a tough root by the aid of an
iron wedge and mallet. On striking the wedge

with the mallet, with considerable force, a portion of the wood flew off, and struck the globe of the left eye, on the temporal side, close to the point of junction between the sclerotic and cornea; but, principally, upon the former: he immediately lost all but the perception of light, and suffered from severe pain; professional assistance was immediately obtained, and the patient was cupped upon the temple; an active dose of aperient was administered; and the eye was fomented frequently with hot poppy decoction: as soon as the aperient had operated, calomel and opium were given, in moderate doses, twice a day. The great suffering soon subsided, but no improvement took place in vision. On the second day, after the injury, I was sent for to see him. On examining the eye, I found the sclerotic and cornea to be perfect, but a good deal of sub-conjunctival ecchymosis; the iris was ruptured to a small extent, near to the ciliary ligament, close to the point at which the violence had been applied; the membrane, generally, dull and discolored, and its power of motion nearly lost; the pupil was rather irregular, but clear, and he had a distinct, though faint perception of light. Evidence of inflammatory action existed in the conjunctiva, sclerotic, and iris. I advised a more active employment of the remedy in use, namely, calomel and opium; and

the application of leeches, should there be recurrence of pain, or additional symptoms of vascular determination. In the course of two or three days, the influence of the mercury was evinced by tenderness of the gums; and, at this period, the perception of light became stronger, and gradually augmented; so that, after a few days more, he was capable of distinguishing a large print: but the power of vision was limited to the inner or nasal part of the retina—a considerable portion of the membrane, immediately subjacent to the seat of injury, remaining insensible. The patient could, indistinctly, discern a small object held directly before the eye; and such object became distinct, if held a little to the temporal side of the organ; but could not be perceived, if held to the nasal side. The mercurial treatment, with quietude and a moderate diet, was continued until all symptoms of inflammation had disappeared; and the restoration of function of the retina remained, for several days, to the extent I have described. The treatment was then, gradually, abandoned, and the patient retains a partial, but useful extent of vision.

In most cases of lesion of the retina, I have observed the same fact which I have mentioned in connection with simple concussion; namely, that if all perception of light be lost, immediately after the receipt of injury, a perfect state of

amaurosis remains. But, if perception of light exist, the recovery of some useful, or good vision, is probable ; but the surgeon should be cautious in his prognosis, in consequence of the risk from subsequent inflammation. The extent of organic lesion may, in some measure, guide the surgeon in his opinion. I have found the lesions of the deeper tunics more manageable, under the subsequent inflammation, than rupture or laceration of the sclerotic. Inflammatory action in the choroid and iris is readily controlled by moderate depletion, and the use of mercury ; but that of the sclerotic often continues, in spite of the utmost care of the surgeon ; and, as I have before mentioned, it induces much suffering ; and, eventually, other textures become involved in the diseased action ; a general chronic inflammation of the globe is induced, and atrophy ensues.

OF THE ORBITAR PORTION OF THE OPTIC
NERVE.

THIS portion of the nerve is about an inch in length, varying, however, a little, in different individuals. It extends from the posterior and inner part of the sclerotic, (from the lamina cribrosa,) to the optic foramen of the cranium, having a course inwards, as well as backwards, from the globe; it is slightly bent in its course; obviously, to permit free motion of the eyeball, without risk of injury to the nerve.

Anteriorly, the nerve is connected with the retina and sclerotic tunics of the globe; and, posteriorly, with the dura mater, and periosteum of the orbit, and is continuous with the cerebral part of the nerve.

The nerve is composed of a dense fibrous sheath, externally, which encloses a number of delicate fibres, invested in a fine cellular membrane; these fibres commence at the lamina cribrosa of the sclerotic, through the apertures of

which the medullary or pulpy matter of the nerve is alone transmitted to join the retina; the fibrous sheath is continuous with the sclerotic around the cribriform opening, anteriorly; and, posteriorly, it joins the periosteum of the orbit, and the dura mater: altogether, the diameter of the nerve is about two lines.

The sheath of the nerve receives its vascular supply from the ophthalmic, and minute twigs are sent from these vessels to the fibres within; the fibres, also, derive branches from the central artery of the retina, which penetrates the nerve, obliquely, in its outer and posterior part; and is continued among the fibres, to the foramen cribrosum, by which it passes into the globe.

DISEASES OF THE ORBIT.

1. THE cellular tissue of this cavity is liable to inflammation, which is sometimes simple and partial; but more frequently general, and of phlegmonous character.

2. It is the seat of scrofulous disease, affecting bone, and causing abscess and exfoliation.

3. The orbit is the seat of tumors of various kinds, which may be divided into simple and malignant—the former, or simple, are of various kinds, as follows :

1. Simple serous cysts.
2. Hydatid cysts.
3. Steatomatous growth.
4. Fibrous growth.
5. Osseous growth.
6. Aneurism.

The malignant tumors are the various growths of fungoid kind.

SIMPLE INFLAMMATION OF THE CELLULAR
TISSUE OF THE ORBIT.

- Symptoms. PAIN deep seated, usually acute and continued, increased on pressure, or moving the globe and eyelids, especially suddenly ; most frequently, the pain and tenderness is partial, and augmented only on particular movement of the eyeball ; sometimes, double vision.
- Appearances. Slight conjunctivitis, projection of palpebræ, and slight displacement of the globe, if the inflammation be advanced redness and œdema of the eyelid or lids.
- General symptoms. Headache, and slight febrile disturbance ; and, afterwards, rigors and chills, indicating suppuration, with the occurrence of local lancinating and throbbing pain.
- Causes. Most commonly, local injury ; but I have known it to take place in scrofulous children, without any obvious reason ; and also in patients recovering from attacks of severe febrile disease.
- Persons liable to. Of all ages ; but as being most frequently the

result of local injury, it is found most often in males, and under the middle period of life.

If suppuration be not evident, local bleeding Treatment. by leeches; the use of hot or warm fomentations; free purging; abstinence; and a few doses of mercury—will generally succeed in subduing the disease. If suppuration be distinct, the pus formed should be evacuated by a free and early incision; for the fascia, and other structures, which close in the anterior part of the orbit, do not readily give way to ulceration; so that the matter is a long time confined, if left to itself; and, by extension, it destroys largely the cellular structure of the orbit, which is very essential to the free and perfect motion of the eyeball. If possible, and likely to produce effectual relief, the opening should be made between the globe and eyelid, through the conjunctiva, as it prevents any after deformity from cicatrix; otherwise, the incision must be made through the palpebræ; and it should be effected in the long axis of this part; or corresponding to the natural direction of the rugæ of the integuments; thus the wound creates very little after defect. There are certain portions which should be avoided—as the lachrymal sac, the site of the lachrymal gland and ducts, the position of the supra-orbital vessels, &c. Subsequent to the

evacuation of the pus, fomentations and poultices must be applied locally, and the general power promoted and maintained, with due attention to the state of the principal secretions. If the puncture or incision be not sufficiently free, it is apt to close too soon, confining some freshly secreted matter, and requiring further operations to promote a cure.

I have twice been consulted about cases, in which acute inflammation of the lachrymal gland was supposed to exist, but which I believe were merely instances of partial inflammation of the cellular tissue of the orbit ; because the swelling was not defined, and extended beyond the site of the gland itself ; and after the resolution of the inflammation, (which took place, in each case, under the treatment I have recommended,) the gland could not be felt ; which I think must have occurred, had it been so much enlarged as the tumefaction during the inflammation indicated ; for its fibrous covering would then have been distended, and the gland could not subsequently have regained altogether its proper position.

If suppuration take place, and a large abscess be formed in the orbit with much destruction of cellular tissue, a subsequent adhesion and puckering in of the eyelid occurs, producing much deformity, and impeding the functions of the

palpebra ; occasionally, also, the movements of the eyeball, in certain directions, are somewhat restricted, from partial adhesion of a muscle or muscles.

PHLEGMONOUS INFLAMMATION OF THE CELLULAR TISSUE OF THE ORBIT.

ACUTE, deep seated, and continued pain in the Symptoms. orbit, extending to the head and brain ;—great tenderness on pressure or on motion of the eyeball ; the suffering much increased by the recumbent posture.

Projection, and perhaps some displacement of Appearances. the globe ; tumefaction of the palpebræ, with œdema ; conjunctivitis ; and, usually, serous chemosis ; palpebræ discolored, being of a dark red or purplish hue ; and, sometimes, tense and shining, as in erysipelas.

Some marked, and often serious derangement General symptoms. of health.

It is often difficult to trace any local exciting Causes. cause of mischief in these cases ; but I have known the local disease to arise after slight injury, as a blow, or exposure to a sudden draught of cold air ; though, in most instances, the patients have not been submitted to injury or

cold. This violent form of local disease rarely occurs, unless under some important derangement of general health. I have witnessed it in connection with erysipelas, and general febrile disturbance, in persons suffering from, and much debilitated by severe febrile disease; as scarlet fever, typhus, &c.; in debilitated women subject to puerperal fever; and in persons having impaired and debilitated constitutions, from excessive intemperance.

Treatment.

As the local inflammation usually takes place under circumstances of much general disturbance and loss of power, the medical man must be cautious how he resorts to even local means of depletion. A few leeches, in an adult can seldom produce mischief; but, nevertheless, in very feeble persons, they must be used cautiously. If the local sufferings be great, and the parts apparently tense from the extent of effusion, I do not hesitate to make free and deep punctures, either between the eyelids and globe, or through the eyelids. This sometimes causes a considerable degree of hæmorrhage; and, by relieving tension, it materially relieves suffering; and, further, now and then, it evacuates matter, of the existence of which there was not any previous evidence. It is merely adapting the treatment, now so generally well understood, for inflammation of diffuse kind, in the cellular tissue

of more superficial parts, to a similar, but deeper seated disease; subsequently, fomentations and poultices should be applied.

The general treatment, upon which the subsidence of the local morbid action mainly depends, must be according to the character of the general affection, and the condition of the principal functions, which my present limits will not permit me to discuss.

In cases of acute phlegmonous inflammation of the orbit, the vision is usually injured or destroyed, either by the rapid stretching of the optic nerve, as the globe is protruded, or else by mischief to the cornea, resulting from the ophthalmia which occurs.

Usually, the symptoms are such as to enable the surgeon to form a correct diagnosis with facility; but now and then, the nature of the disease may be obscure, either from the imperfect history given by the patient, or the existence of some unusual symptom.

92. An elderly woman applied at the Ophthalmic Hospital, some years since, having experienced all the marked symptoms of acute inflammation of the cellular tissue of the orbit, in an aggravated degree; at the time of her application the palpebræ and globe of the left eye were greatly protruded, the former being much discolored, swollen, and tense; the parts were ex-

tremely tender ; and the local suffering and general disturbance of health were great.

It was considered expedient to make a puncture or incision to relieve the tension, and to permit escape of matter, if formed ; and the patient was placed on a couch to have this operation done, when we found so strong a pulsation pervading the whole swelling, and even moving the globe, that a doubt immediately arose as to the probability of the disease being aneurismal ; a review of the history of the case denoted phlegmonous disease, and it was decided that a small puncture should be made at the lower part, between the globe and lower eyelid ; this was accordingly done by my colleague, Mr. Scott, and the result was an immediate escape of florid blood of arterial character, with a jet corresponding to the pulsatory movement of the swelling, which was synchronous with the pulsations of the arteries ; the wound being small, the hæmorrhage was easily controlled by moderate pressure ; the patient was placed in bed with the head and shoulders well raised, and measures were adopted to relieve her suffering, and to lessen the general disturbance, which at that time forbade any formidable operation. In a day or two, the compress, which had been placed over the seat of puncture to prevent bleeding, was removed, in consequence of the patient's complaining of it ;

when some slight discharge of matter took place from the puncture, but no blood escaped : on the next day, the suppuration became exceedingly free, and all the symptoms greatly mitigated ;—the first diagnosis proved correct ; it was a case of phlegmonous inflammation of the cellular tissue of the orbit, passing to the suppurative stage ; only, from the extreme degree of vascularity of the parts, and the inordinate determination of blood to them, during the active stage of the disease, it had assumed an aneurismal character.

OF SCROFULOUS, OR SCROFULO-SYPHILITIC DISEASE OF ORBIT.

As periosteal disease of similar character in Symptoms. other parts, that of the orbit is attended with a dull pain, of remittent or intermittent kind ; being most severe, or coming on, in the evening, or at night ; much tenderness, which is greatest during the increase of pain at night ; swelling, &c.

At first, a hard inelastic swelling without dis- Appearances. coloration ; soon, however, a dull or dark red hue pervades the skin upon the tumor ; the

swelling becomes soft and elastic ; eventually, it points and bursts, and gives exit to an ill formed, sanious, and offensive matter ; the secretion of which afterwards continues, and is discharged, producing irritation and excoriation of the surrounding skin. If a probe be passed into the wound, a part of the bone will be found denuded and exposed, being very irregular in its surface, and, perhaps, soft or spongy in its texture.

General
symptoms.

Usually, some marked indication of strumous diathesis, or syphilitic taint, with a depressed condition of the system.

Causes.

Most frequently, this affection occurs without any particular local cause ; but, occasionally, it arises in consequence of local violence, especially in the scrofulous subject.

Treatment.

Locally, if suppuration have not taken place, I recommend very light friction with iodine or blue ointment combined with opium, night and morning ; or, in cases of much local tenderness and pain, a blister may be previously applied ; or, perhaps, a few leeches ; and even after suppuration is distinct, I should advise the trial of such local means in combination with general treatment ; as it is very possible to get considerable quantities of pus absorbed, in such cases ; and the patient is thus usually saved from a tedious process of exfoliation, (for a portion of bone

inevitably separates if the swelling be opened,) as well as much deformity, from a puckered and discolored cicatrix.

The general treatment consists in attention to the principal secretions; to dietetic, and medicinal means to improve and maintain a proper state of general power; with the exhibition of mercury or iodine, in alterative doses, as very greatly aiding the desired purpose.

When the scrofulous abscess, connected with disease of the bone of the orbit, discharges by an ulcerated or artificial opening, there is usually some subsequent exfoliation of bone, which occupies a long time in completion; and requires the same plan of treatment, as analogous disease in other parts of the body.

The deformity, which is frequently occasioned by the healing of the wound, should be allowed to remain, for at least twelve months; so that the new matter may become well organized, and the contraction of the cicatrix completed, before any attempt to relieve, by operation, be made.

OF TUMORS OF THE ORBIT.

THERE is much difficulty in forming a correct diagnosis respecting the various tumors of chro-

nic formation in the orbit, until they project so much as to come under fair examination by touch ; and, even then, an accurate opinion cannot be formed, in many cases, unless other symptoms have been, or are, present to aid the judgment.

The simple cyst, the hydatid cyst, the adipose deposit, and the chronic fibrinous swelling, or an exostosis, may arise without pain or uneasiness ; and only be known, or suspected, by increasing so as to cause some displacement of the globe, or impediment to its motions ; and, unless the formation be placed so that it can be submitted to examination by touch, the precise character of the disease cannot be ascertained.

The simple and hydatid cysts, the steatomatous, or fatty tumor, and an exostosis, so generally form without pain, that there can be little certainty in any diagnosis, whilst they remain deep seated, and out of reach. Some opinion may, however, be formed, by the degree of resistance offered to any endeavour to press the displaced globe into its proper position. There is, generally, least resistance when the tumor is adipose ; and the pressure induces but little inconvenience or suffering. If the tumor be encysted, simple, or hydatid, it will offer more resistance than the steatoma or fatty swelling, and afford more sense of elasticity : but, if the disease be

exostosis, there will not be any yielding on pressing the globe, and the pressure will occasion more pain in the eye, and disturbance of vision.

When these tumors protrude, or form near the surface so as to be submitted to examination by touch, the exostosis can be directly distinguished by its firmness, and inelastic feel; but the encysted and fatty tumors are still often obscure; for the strong fascia of the palpebræ disguises the lobulated character of the steatomatous or fatty tumor, and gives it a uniform surface and elastic feel, which make it very closely to resemble a cysted swelling.

The chronic fibrinous tumor rarely forms without some uneasiness or pain; and, usually, a dull occasional aching, which is most felt at night, or on sudden approach of cold and damp weather. I have, however, known such formation of great extent, without marked symptoms.

When within reach of the finger, the fibrinous swelling is recognized by its firmness and little elasticity; and also, by its unequal surface, and immobility. As regards the fibrinous tumor, and exostosis, there is often corresponding disease in some neighbouring part, which further materially aids in forming the diagnosis.

Whilst diseases of these kind remain obscure, Treatment. and do not threaten permanent injury to the eye or vision, I think it is most prudent not to at-

tempt any operative measures ; but to endeavour to retard the growth, or to subdue them, by a mild alterative treatment, and the application of a blister, or two, to the forehead or temple ; and, afterwards, the use of an ointment of mercury or iodine, or of both ; and, even when they are likely to prove injurious to the eye, such means should be generally employed before operation be resorted to. Moderate mercurial treatment, with the local remedies I have mentioned, will often arrest the growth of such diseases ; and, in some cases, the morbid growth becomes absorbed, under a free use of this powerful agent. If, therefore, the very moderate and careful use of mercury have a decided effect in arresting the increase of orbital tumor, it is frequently worth while to push the remedy, supposing no constitutional circumstances forbid, until its influence appears expended, or the disease disappears.

Case.

93. A gentleman, between thirty and forty years of age, of good constitutional power, came from Ireland to consult me, having his left eye considerably protruded in a direction forwards, and a little downwards ; this protrusion had taken place very gradually, and had not disturbed his vision, or very slightly so : he had been actively treated for a short time in Dublin ; but the protrusion had sensibly augmented during the treatment.

No part of the tumor was within reach of the finger ; and the resistance to pressure on the globe, left me in doubt as to the disease being encysted or fatty. By my advice, he took small doses of mercury, so as slightly to affect his mouth ; and he kept up the moderate action for several months ; using, at the same time, a nutritious and careful diet ; and pursuing his professional duties as a lawyer. He also applied two or three blisters, in succession ; and, subsequently, rubbed in some iodine ointment to the eyebrow and temple. Soon after he commenced this treatment, the disease seemed stationary ; but as no perceptible diminution occurred, after above six months perseverance in the plan, it was gradually abandoned. The tumor has since remained perfectly quiet, and without increase. Since the termination of the course of mercury, I have carefully examined the eye, &c., and find that I can more readily press back the globe to its proper position, without inflicting pain. I am disposed to consider the orbital deposit as steatomatous.

94. I was requested to see a gentleman, aged Case. forty-seven, in consultation, respecting the propriety of attempting to extirpate a tumor from the left orbit, which had caused considerable protrusion of the left eye, and which, in a great measure, impeded the functions of the levator

palpebræ, and of the superior rectus, or levator oculi : the globe was forced downwards and forwards ; the cornea was directed downwards ; and he could raise the superior eyelid but little ; there was a good deal of conjunctival redness from congestion of vessels, but his vision remained good ; though it was double when the eyelid was raised, and any small object was placed in the range of the two eyes ; the progress of the disease had been very slow, and without pain, until the occurrence of the ophthalmia, which was of congestive character, and did not produce much inconvenience. The anterior part of a tumor could be readily distinguished, by touch, at the upper part of the orbit, immediately beneath the superciliary ridge ; it was firm, possessing very little elasticity, and irregular in its surface ; a small distinct and elastic tumor could be felt at the outer and anterior part of the larger and firmer swelling : this, from its size and character, I believed to be the lachrymal gland ; the morbid growth was fixed, as far as I could ascertain. I considered the disease to be of fibrinous character, connected with, and probably originating from, the fibrous tissue of the orbit. I therefore recommended the use of mercury, and the occasional application of leeches, to relieve the congestion of the conjunctiva ; and the employment of blisters,

now and then, and friction with blue ointment and iodine, to the eyebrow and forehead. The general power and habits of the patient, with his strict attention to our advice, and great patience, were most favorable to promote our views. The treatment was cautiously begun and proceeded with; but we were enabled to go on more rapidly than usual, in consequence of his not suffering in health or spirits; in about three weeks, his mouth became sore, and the disease was evidently influenced; a sensible diminution had taken place; the extent of mercurial influence was not, therefore, augmented, but kept up in a moderate degree; whilst his strength was maintained by a good nutritious diet. After a short time, a more rapid decrease in the disease occurred, which went on, for a few weeks, and then became again more gradual: but the recovery proceeded without check; and, after nine months, all evidence of orbital tumor was gone; the globe had recovered its proper position; but slight defect in the levator palpebræ and levator oculi remained for some months. Above three years have afforded satisfactory evidence of the completeness and soundness of the cure. The lachrymal gland can now be easily felt, a little internal to, and below, the external angular process of the frontal bone, beneath its proper position; it can be readily returned to its natural

site, but drops again from it, as soon as support is withdrawn; its fibrous connection or covering, by which it had been properly retained in position, had been elongated, as the gland was displaced by the growth of the tumor; but as the tumor was absorbed, the fibrous tissue did not recover itself, but it remains elongated, and allows of a dropping of the gland.

Case.

95. A young man, about twenty-two years of age, lately applied to the London Ophthalmic Hospital, in consequence of having strabismus and double vision, from displacement of the globe, caused by some orbitar deposit. The disease had existed only a few weeks, and had been attended by an occasional dull pain: on attempting to press the globe to its proper position, there was much resistance, but it was not painful; the patient had not any other indication of local or general disease, nor was there any reason to suspect specific taint. Very moderate use of mercury, with the application of a blister, and friction with iodine ointment, to the brow and temple, and attention to diet, speedily removed the disease. In a few weeks, there was nothing to indicate his having had affection of the orbit, or eye. I believe the deposit to have been fibrinous.

Case.

96. A woman, near sixty years of age, became a patient at the Ophthalmic Hospital, having

her right eye much displaced outwards and slightly downwards, from a tumor in the orbit. The disease had been of slow growth, with occasional pain, and slight attacks of ophthalmia. I could detect a part of a tumor deep in the orbit, just above the lachrymal sac, to the upper and inner part of the globe. I had little doubt of the disease being of fibrinous character, but I could not venture on a free use of mercury, because of an indifferent condition of health, and general irritability. I gave her, however, minute doses with sarsaparilla, and allowed her a generous diet, and directed mercurial friction to the brow with opium. Little change occurred, for many months ; perhaps the tumor augmented slightly : there had, however, been much irregularity in the plan of treatment ; partly from disorder of health, and partly from neglect. The patient became at last satisfied, that she was better in health and general feeling, whilst taking her medicine and obeying our directions regularly ; and she, consequently, became more steady and persevering in the use of them ; and, in the course of a few weeks, the advantage obtained was evident in a better state of health, and a sensible diminution of the local disease. I could not induce her to go on for more than seven or eight months, although the remedy did not produce any distress or inconvenience, but

altogether rendered her more comfortable; only a trifling diminution was effected; she has since, repeatedly resorted to the same treatment, for several weeks together, during a period of six years; and, principally, when her health has been disordered. She has always experienced benefit from it as regarded her health, and it has by degrees produced a great effect on the orbital disease; for, at the present time, the protrusion is very slight, and no tumor can be detected by digital examination.

In two of these cases, I am satisfied, that the disease could not have been perfectly extirpated without great risk, not only to the eye, but to life, from the extensive connection of the morbid growth to the orbital plate of the frontal bone; which, being denuded of its periosteum, if not removed at the time, would probably have separated by subsequent exfoliation.

In all cases of orbital tumor, where operation is contemplated, the probability of the connections of the diseased mass should be calculated; for if the disease be not perfectly removed, the operation will not afford more than temporary relief, and will often hasten an unfavorable termination; as the morbid action may be renewed, with additional force, in consequence of the local and general disturbance excited by the operation.

I believe that the encysted tumor is less under control, by medical treatment, than the adipose, fibrinous, or osseous : yet, when doubt exists respecting the nature of the disease, the mercurial plan should be tried, as far as circumstances will permit of, without risk ; but, after a fair trial of such means, if the doubtful tumor increase, or if, on first examination, the character of the tumor be obvious, a puncture should be cautiously made, so as to ascertain the nature of the swelling, and the property of the contents ; provided it be not congenital and attached to the bone, as I shall describe under the subject of diseases of the palpebræ. If the cyst be deep seated, I think there is less risk in attempting to destroy the secretory surface, and to cause an obliteration of the cavity, than would arise from an attempt to excise it ; because the attachment of the cyst cannot be ascertained ; if, however, the cyst or tumor of any kind, be superficial and moveable, it will be best to excise it at once, without any trial of alterative or other medicinal or local remedies. I have several times removed small cysts, superficially situated, and loosely connected from the orbit, and without any ill consequence in any instance ; and I have witnessed attempts made to excise deep seated cysts, which have proved unsuccessful, as regards the removal of the disease,

and of serious mischief to the eye in most instances.

The plan of treatment, which I have found successful, has been that of exciting an inflammation in the cyst, when emptied of its contents, so as to cause effusion of fibrin with agglutination of the surface, and obliteration of the cavity.

Case.

97. Some years since, a young man became a patient at the Ophthalmic Hospital, having a large encysted tumor, at the upper and fore part of the orbit; it was punctured by Mr. Lawrence, and proved to be hydatid: a common probe was passed into the parent cyst, (which appeared in part fixed,) so as to break up or detach the progeny; and, subsequently, as no inflammation occurred, a stimulating lotion was injected into the cyst; and this, after a few repetitions, succeeded in producing the desired deposit, and closure of the cavity or bag. The disease had arisen slowly and without much suffering.

Case.

98. About three years since, I admitted a young man into St. Thomas's Hospital, who had his right eye protruded very much downwards and outwards. The disease had been at first very slow in progress, but, a short time before I saw him, it had advanced quickly; and, by stretching the optic nerve, or by pressing upon it, the tumor had occasioned great disturbance

of vision. The tumor had advanced sufficiently forward to render its character obvious ; but the extent and direction of the protrusion of the globe satisfied me, that the cyst passed deeply into the orbit. I therefore preferred an endeavour to promote adhesive inflammation in the cyst, to an attempt to excise it ; and, accordingly, I made a free puncture through the upper lid into the cyst, and evacuated about three drachms of light yellow colored serum, which I considered a favorable indication of the character of the cyst, as to its taking on the desired inflammatory action with facility. After the cyst was emptied of fluid, I placed in it and the wound, a piece of common wax bougie, and confined it, so that it could not escape from the sac altogether ; but, so that it might have been removed easily, in case of its exciting too much action ; a good deal of pain, and rather an acute attack of ophthalmia came on in the course of two days, when I withdrew the piece of bougie, and employed the ordinary means to reduce the inflammation of the conjunctiva, which was most troublesome and serious. Before the ophthalmia was checked, slight ulceration took place on the cornea. In the course of two weeks, the patient was well, excepting a small opacity of the cornea. I conclude that the cyst became obliterated, as he has not had any return of the tumor.

Aneurismal tumor in the orbit has not come under my observation ; there are several cases on record, and the success of an operation to secure the common carotid has been such as to warrant its performance, when aneurism of the orbit exists.

MALIGNANT TUMOR.

MALIGNANT tumor of the orbit is rare ; but, when occurring, it proceeds much more rapidly in growth, than the chronic tumors. There is generally also a congested state of eyelid, and an enlargement or varicose condition of the cutaneous veins of the palpebræ ; besides, the aspect of the patient, and the disorder of the general health, connected with the development of fungoid disease, are usually present. It is, however, in most instances, very difficult to decide upon the true character of these diseases, on their first appearance ; and I think it very probable, that the growth may be simple at first ; but takes on malignant action, under much derangement or disturbance of the general health, induced by ordinary affection, or by the suffering and loss of blood consequent upon an operation.

Indeed the opinion which I have expressed on

the subject of malignant disease of the retina, I consider equally applicable to those of the orbit; and, I believe, that if the influence of an alterative or mild mercurial treatment, which tends to improve and maintain a good state of general health, have not beneficial influence on the local disease, that it is not likely to be cured by operation.

The very unfavorable result of the operations which I have witnessed for the removal of deep seated tumors, of doubtful nature, from the orbit, induces me most earnestly to recommend, that a fair trial be given to medicinal and local treatment short of operation, before such proceeding be adopted; and that the surgeon should not apply the knife without being convinced, by a careful enquiry and examination, that good is likely to result.

OF INJURIES TO THE OPTIC NERVE.

THE orbital portion of the optic nerve is liable to injury, from fracture of the orbit; from wounds penetrating the orbit; or from violence which causes sudden displacement, or dislocation of the globe, through the palpebral aperture of the eyelids.

Actual division, or laceration of the optic nerve, or a part of it, such as may occur from fracture of the orbit, or wound penetrating the cavity, is, I believe, immediately, or remotely, destructive of vision.

Simple contusion or stretching, as produced by fracture of the orbit, or dislocation of the globe, if unconnected with injury to the globe itself, may be recovered from, if not of such severity as to occasion immediate and perfect loss of sight.

The best treatment, in my opinion, for these cases, is that which I have described for concussion of the retina.

I have seen two cases of dislocation of the globe from imprudent forcible examination of the eye—the tarsi being pressed into the orbit, behind the anterior hemisphere of the organ; the mischief was readily repaired, and the globe reduced without any injury to it, or to the optic nerve: vision was not materially affected by the dislocation.

Case.

99. A case occurred, which was brought to St. Thomas's Hospital, in which the globe was dislocated by violence, not, however, productive of any laceration, or other serious mischief; the injury had been inflicted above an hour before the patient came to the hospital; and when he presented himself there, he complained of pain and confusion of vision.

Reduction was accomplished after a little trouble, by passing the end of a narrow smooth spatula beneath the superior eyelid, and pressing it upwards and forwards, whilst the globe was pressed gently backwards.

The patient recovered vision in a few hours, and had no subsequent inconvenience.

ANATOMY
OF THE
CEREBRAL PORTION
OF THE OPTIC NERVE.

FROM the optic foramina, the nerves pass backwards and inwards to the site of the processus olivaris, in front of the sella turcica, where they join, and the optic commissure is formed : from the commissure, two flattened white cords pass backwards, first diverging beneath the outer part of each crus cerebri, and the inner part of the base of each middle lobe of the cerebrum, and then converging towards the corpora quadrigemina, and posterior part of the optic thalami.

From the optic foramina to the commissure, each nerve is invested in a tubular portion of pia mater and arachnoid membrane ; and the structure of the nerves becomes softer.

The commissure, which is about four lines in

length, and the same in breadth, is intimately connected with the grey matter at the infundibulum, and, at the base of the third ventricle, numerous filaments of the nerves can be traced into the grey matter: in tracing the nervous cord from the commissure to the corpora quadrigemina, it is at first found slightly flattened, and, after a short course, it becomes perfectly so; the inner or concave margin of this cord is free and unattached; but the outer convex margin, is connected with the under part of the middle lobe, by numerous minute nervous filaments, which interlace with those of the crus cerebri; the cords terminate in connection with the grey matter of the corpora geniculata externa and interna, and with the posterior tubercles of the corpora quadrigemina, or the nates; some fibres pass to the medullary layer of the optic thalamus.

Between the commissure and the quadrigeminal bodies the nerves are only covered, inferiorly, by the pia mater and arachnoid membranes.

The commissure, also, is covered by arachnoid and pia mater; and the structure of this part, and of the nerves beneath the middle lobes, &c., is similar to the medullary portion of the brain,—being softer, and of more uniform appearance than the orbital part of the nerve.

There is still much difference of opinion re-

specting the distribution of the nervous filaments in the commissure ; some considering that the whole of the filaments from the right side pass to the left, and those from the left to the right, so that there is a perfect or entire crossing, or decussation ; others state that the decussation is partial, and takes place, principally, between the inner filaments, or those nearest the centre of the commissure.

I believe that there is, generally, some crossing of filaments at the commissure, and that the extent of such decussation varies much, in different individuals ; and, I have come to this conclusion, principally, from pathological observation, in examining the parts in persons who had lost one eye, several years before loss of life. In some cases, I have found the nerve of the previously useless organ shrunk as far as the commissure ; and, most frequently, some diminution of the cord, posterior to the commissure, on the same side ; but, occasionally, a diminution of the cord, behind the commissure of the opposite side.

If the decussation or crossing were uniform, such variety would not, in my opinion, be found.

The very extensive cerebral connections of the optic nerves readily explain the various modifications of amaurosis, in consequence of cerebral disturbance.

FUNCTIONAL AMAUROSIS FROM CEREBRAL
DISTURBANCE.

THIS form of amaurosis is seldom complete or perfect ; the function of vision being either partially interrupted or generally obscured, but not destroyed.

The patient either loses the perception of a Symptoms. part or parts of a large object ; thus, he may see the upper half of a face without being able to distinguish the lower half ; or he may be able to perceive one side of the face only, (*hemipopia, visus dimidiatus*;) or the central part may be distinct while the lateral portions are invisible ; or further, on the contrary, the lateral parts may appear whilst the central is obscured. Sometimes the extent of the amaurosis continues the same through the attack ; but in other instances, it increases so as to extend over the whole field of vision.

In these cases there is not any appearance of spot, spots, web, gauze, cloud, or other matter

intervening between the eye and the object, as in choroiditis ; but part or parts of the object are only very faintly distinguished, or are invisible.

General
symptoms.

Severe general headache either precedes or follows the above symptoms, and the patient usually suffers from chilliness, nausea, loss of appetite, and general depression.

Appearances.

The pupil is usually somewhat dilated, and the patient is pallid, and has a vacant look.

Causes.

This amaurotic affection evidently depends upon an irregular state of cerebral circulation, sympathetic with gastric or hepatic irritation or derangement ; it seldom continues beyond a few hours : I have myself experienced this affection several times. I had two or three attacks of it before the age of puberty : they became more frequent about the adult period ; but have latterly been of rare occurrence. With me, the amaurosis has always preceded the headache and nausea, and has been evidently caused by gastric irritation.

I have been consulted by many fellow-sufferers, of both sexes, and in some the cerebral pain has preceded the disturbance of vision, but in most it has occurred subsequently ; in a few, the irritability of the stomach has been excessive, and attended with violent vomiting. I have remarked in my own case, and found by enquiry

from others, that the portions of the nerve affected are not the same in each attack ; but that the obscurity takes place in different positions, and varies in its extent at different times.

I have known a similar form of amaurosis produced, by the irregular cerebral circulation which sometimes follows concussion of the brain ; the affection has then been more continued, and of more gradual development, attended by giddiness, headache, noise in the ears, irritable stomach, &c. ; symptoms which cannot fail to indicate the nature of the disease, when viewed in connection with the history of the case.

The cases depending upon gastric disturbance Treatment. are best remedied by an emetic, followed by an active purge ; or by a dose of mercurial with opium, and a draught of senna and some alkaline purgative salt, a few hours after. I have, generally, adopted the latter plan, and have obtained speedy relief. But when I have neglected, on two or three occasions, to attend to the attack at first, its recurrence three or four days in succession has, at length, compelled me to resort to the medical treatment ; and I have, on such occasions, been obliged to take two or three doses.

Attention to diet forms a very necessary part of the treatment ; and the patient should be

careful, as regards both quality and quantity of food, for some time.

This affection, when caused by concussion, disappears, as the cerebral circulation recovers its balance, under the ordinary treatment.

ORGANIC AMAUROSIS FROM DISEASE OF THE
BRAIN, OR ITS MEMBRANES.

AMAUROSIS resulting from organic cerebral mischief presents great variety in symptoms, according to the seat, the nature, and extent of the change.

I have seen a few examples of incomplete or partial amaurosis, resembling that described as functional, with *visus dimidiatus*, &c. ; but of continued character, and unattended by gastric irritation or disturbance. I place it under the head of organic disease, as I consider it to result, not merely from an altered circulation ; but to be caused by a morbid deposit.

100. A gentleman came to me by the recom- Case.
mendation of Sir Astley Cooper, with defective vision in both eyes, but principally in the right ; the field of vision was partially affected : he could see parts of an object looked at, but the other parts appeared to be entirely wanting ; not as if obscured by any intervening opaque body,

but as if deficient. He had slight strabismus, but there was no other indication of disease in the eye : the pupils were natural, and the irides active : he suffered from headache, and from a partial hemiplegia ; for he had lost the function of sensation altogether in one leg, and, in a great degree, in the arm of the same side ; but he retained the power of motion so that he could walk ; but he was obliged to look, to ascertain that the affected leg was in proper position, before he could venture to rest the weight of the body upon it, in bringing the other leg forward ; he was also uncertain, when he endeavoured to seize any thing with the hand, whether he retained possession of it, until he ascertained that he did so, by vision. There could not be a doubt, in this case, of the existence of cerebral mischief ; and further enquiry led me to conclude, that this mischief was connected with some syphilitic taint : for there were evidences of syphilitic disease in the throat, and on the skin. I, therefore, gave him mercury so as to produce a moderate degree of salivation ; and, at the same time, supported him well by a good diet, and a moderate allowance of stimuli. This plan of treatment, carefully continued for a few weeks, succeeded in effecting all we could wish. The partial amaurosis was perfectly subdued, and he regained sensation in his limbs and has

since remained well. More than ten years have since elapsed.

I have seen only two other cases of this kind ; and, in each, the obscurity or loss of vision was partial, and the pupils rather dilated, with sluggish irides, but no perceptible change in humor or tunic ; the disease was of slow progress, and affected one eye more than the other.

Each patient had been the subject of syphilis, and evinced some constitutional taint, having periostitis, or affection of the throat, or cutaneous eruption.

The indication for treatment was, therefore, tolerably plain. Mercury was administered with care, (as I have previously described,) and with the best effect, in removing the imperfection of vision, as well as the other evidences of syphilitic taint.

I shall now endeavour to point out the principal symptoms which I have noted, in connection with amaurosis resulting from cerebral mischief. Symptoms.

There may be partial or complete, imperfect or perfect, loss of vision, without any alteration in function, in any part of the structures of the eye, or its appendages, except the retina ; and without any visible organic change in the retina itself ; even the iris may act freely and rapidly, although there be little or no perception of light ;

though, most frequently, the pupil is dilated rather more than natural, and the iris moves tardily.

Such a form of amaurosis may have been preceded by headache, or giddiness, and have been rapid in its progress ; or have occurred very gradually, without any marked symptom of cerebral disturbance ; the latter, I think, is most common.

Under such circumstances, one eye is often affected without the other : and if both be attacked, the amaurosis is more rapid in one than in the other : and, frequently, at the commencement of the disease, the field of vision is not equally obscure.

As the amaurosis increases, the symptoms indicating cerebral mischief sometimes become developed, and the patient usually acquires the vacant aspect which is so general in blind persons.

When the amaurosis occurs rapidly, the symptoms of cerebral disturbance are usually more marked, than when it is of slow progress.

With the disturbance of vision, there may be an occasional, or constant appearance of double objects, when the two eyes are employed ; and this double vision will generally be more evident when the patient directs his attention to any object immediately before him ; whilst, in a lateral direction objects may appear single.

The double vision is, in such cases, the consequence of loss of muscular power, by which the parallel motion of the two eyes is in part destroyed, and a squint (*strabismus*) is produced. When, therefore, the patient looks at an object directly in front of him, the axis of the organs not being parallel, the object viewed is reflected upon portions of the retina, which do not correspond, or rather, which have not been previously associated ; and a double impression results.

Most frequently the *strabismus* affects one eye only ; but I have seen partial and complete paralysis of some of the muscles appertaining to each.

The direction of the squint, or the direction of the axis of vision of the affected globe, of course depends upon the seat and extent of the muscular paralysis.

I have frequently observed the degree of *strabismus* to be so slight that it would probably escape ordinary observation, especially under a lateral or oblique view of the eyes ; but it is more commonly so obvious, that it must attract the attention of the medical attendant, on a superficial inspection.

It may be proper to observe that *strabismus* is frequent, from other causes, when it usually precedes the *amaurosis*, (imperfection of vision being the result of the *strabismus*,) and affects

only the eye which has its movements impeded, or irregularly performed.

Of the nerves which supply the muscles of the globe, &c., the third and sixth are most frequently influenced by cerebral disease. I have not been able to detect paralysis of the fourth, and believe that the position of its origin, and its course in the cranium, render it little liable to be implicated, in the most frequent cerebral disorders.

The third nerve is the one which most frequently suffers, and the muscles to which it is distributed have their power diminished or destroyed; and, according to the degree in which the paralysis exists, the following symptoms are more or less developed.—

The superior lid drops, the globe is abducted and slightly depressed, so that the axis of vision has a direction outwards and slightly downwards, from the action of the abductor and superior oblique muscles, which alone retain their ordinary power; the pupil is somewhat dilated, and the iris moves very sluggishly, or is fixed, and the vision is imperfect; and if the patient have sufficient power of vision to distinguish objects of moderate size with the affected eye, such objects appear double when looked at with both eyes; except when in such a position that the axis of the sound eye is necessarily rendered pa-

rallel to that which is nearly fixed in the direction I have mentioned ; it is generally necessary to raise the superior eyelid, to expose the globe, and ascertain many of the appearances described ; and if the patient endeavour to move about when the lid is supported by the finger, he is not only confused by the double vision, but suffers from giddiness.

In consequence of the falling of the superior palpebra, the disease has been named *ptosis*, (from *pipto*, to fall.)

The pupil being invariably dilated in these cases, proves, I think, that the branch of the third nerve, which joins the lenticular ganglion, is distributed to the iris, and has a material influence on its motions ; and, further, the position of the globe, with the axis of vision directed outwards and a little downwards, proves that the action of the superior oblique muscle aids in directing the eye downwards and outwards.

Paralysis of the sixth nerve is much less frequent, and causes the axis of vision to be inclined inwards towards the nose, and when combined with amaurosis, the pupil is not always dilated, but most frequently, of natural size, and obeys the influence of light ; the iris is, however, rarely so active as is natural.

There may be amaurosis with a fixed and protruding eyeball, and, at the same time, dropping

of the superior lid, and dilated and fixed pupil; this results from paralysis of all the ocular muscles; and the globe, having lost the support of the recti muscles, either falls forwards, or is in a degree projected by the elastic cellular structure, which exists at the back of the orbit.

Causes.

These various modifications of amaurosis are caused by some cerebral pressure, as thickening of membrane, or bone, effusions of fibrin, pus, or serum, extravasation of blood, the growth of various tumors; or they may be produced by the morbid change which has been termed *Ramollissement*.

There are, usually, some general circumstances, connected with the cerebral mischief, which may aid, materially, in the diagnosis, when the case, as regards the amaurotic disease, is otherwise obscure. Thus, the attack may have been preceded by mental irritability and disinclination to employ the mind; and there may be sensible loss of muscular power with the commencement and progress of the amaurosis.

The pulse is, usually, slow and labored, but compressible; the extremities are cold, and the surface pallid; and the patient frequently has cramps when recumbent, and snores much during sleep. There is, in fact, general evidence of diminished nervous susceptibility, in the want of activity in the principal functions, in most

cases; and in the majority, some symptoms which may, under patient investigation, enable the medical man to form a correct diagnosis; the importance of which will be made evident shortly.

Syphilis and scrofula dispose to organic disease of bone and membrane, which may occasion cerebral pressure and amaurosis; and the latter predisposes to the formation of tumors in the substance of the brain, or in connection with its tunics.

Injuries to the head, the effects of which are often very remote; fevers with cerebral determination; *coup de soleil*; intemperance, gluttony, violent anger, excess of mental labor, and excitement, are the more immediate causes of cerebral mischief; whilst the sudden arrest of any material, natural, or habitual secretion, or discharge; or the suppression of any long standing or extensive disease; or any thing which produces a sudden tension of the vascular system, predisposes to similar disease; and favors the occurrence of apoplexy, or the development of slow inflammatory action;—now and then we find an apoplectic diathesis, without any peculiarity of vascular action generally; but the most insidious cases are those, in which the disease is induced by mental labor or anxiety, not in great excess, but in persons subject to frequent or continued

derangement of stomach, liver, or some important part or parts of the alimentary apparatus.

Amaurosis from cerebral disease of organic kind is frequent during dentition ; and often occurs very suddenly, as other parts sometimes become paralyzed ; but in most instances, it is slowly developed, and the consequence of serous effusion. I have, also, seen this form of amaurosis produced in children, by the sudden suppression of extensive cutaneous eruption, or by checking a diarrhœa ; from whatever cause the cerebral mischief arises in children, it is generally well marked, by the ordinary symptoms.

The most insidious forms of the disease come on after the age of puberty, and are most frequent about, and after the middle period of life ; but from the variety of causes no particular period of life is exempt from amaurosis, from organic cerebral change or morbid deposit.

The prognosis, in these cases, is favorable or not, according to the extent of disease, the rapidity of its formation, its continuance, or its cause ; thus, when in addition to the amaurosis, hemiplegia, paraplegia, or other form of paralysis, evince, extensive cerebral disease, the prospect of restoration of vision is very indifferent, especially when the disease has occurred suddenly, and the amaurosis is complete or nearly so ; and

the probability of recovery lessens, usually, in proportion to the continuance of the affection. Further, the cause of the organic cerebral disturbance will sometimes render the prognosis unfavorable; for example, severe injuries to the head, extensive sanguineous extravasations, or sudden effusions, during teething, or fever, &c. I also consider the prognosis bad, when the disease makes progress with little or no interruption, and offers scarcely any variety, being rarely stationary; never mitigating, but always more or less in advance, under ordinary circumstances. This happens during the growth of some tumors, and under the change termed *Ramollissement*.

In nearly all the cases of cerebral disease with Treatment. a diminution of nervous power, the vascular system suffers in common with other parts, and the action of the heart and arteries frequently appears to contra-indicate the loss of blood, in the treatment of the disease,—the pulse being slow and easily compressible, the face pallid, and the extremities and surface cold. Every medical practitioner must be familiar with such condition, as consequent upon injuries to the head and apoplectic attacks; and have observed how the action of the heart and arteries rises, and becomes augmented in force and frequency, under the judicious abstraction of blood, which relieves the cerebral pressure, and thus restores nervous energy.

The same effect is sometimes produced in the vascular system, by cerebral mischief of slower and more insidious character; and it is, therefore, occasionally found when amaurosis is present; and such cases so closely resemble an opposite form of disease which is termed asthenic; that much care and discrimination are required in forming a correct diagnosis. I shall refer to the subject again, after I have described the asthenic disease.

With a very few exceptions, the treatment of organic amaurosis, (cerebral,) will be comprised under the following heads:

1. Relief of vascular turgescence, by general or local bleeding.
2. Prevention of further congestion or turgescence, by diet, mental and bodily quietude, and counter-irritation.
3. Promoting absorption of morbid deposit, by counter-irritants, mercury, iodine, &c.

1. General abstraction of blood is required, in cases in which the amaurosis appears suddenly with giddiness, headache, torpor, or marked symptoms of cerebral congestion; as in injuries to the head, or apoplexy; or after intemperance, gluttony, anger, or suddenly suppressed secretion or discharge; or suddenly repelled superficial disease, as in gout, erysipelas, &c. In the first instances the pulse may be slow, compressible,

but labored ; in the majority of cases it will be full, incompressible, and perhaps quicker than usual. The blood should be removed by venesection, and in such quantity as to produce a marked effect on the vascular system ; the orifice should be large, and the patient erect during the operation : and the pulse should be carefully watched during the flow of blood, so that the stream may be arrested as soon as a decided change is perceived in the beat of the artery. With such caution this part of the treatment can rarely do mischief ; for the action of the heart and arteries readily indicates the amount of loss of blood which the system will bear. Thus while the young and robust patient may lose from twenty to thirty ounces of blood, without marked change in the beat of the pulse, the old or feeble may evince such change in pulse after a loss of perhaps not more than six or eight ounces ; yet, in each case, the desired effect may be equally well produced.

It is not by the amount of blood abstracted that good is effected, but simply by moderating the force or power of vascular action. The indications for a repetition of the operation consist in a return of the symptoms described.

I much prefer venesection to arteriotomy in the temporal vessels, as the latter necessarily

leads to an interruption in the superficial circulation, by division of the artery, or from pressure over the site of puncture to arrest the flow of blood, and because I have observed the effect of this plan of abstracting blood frequently prejudicial, instead of beneficial, in severe cases of ophthalmic inflammation: so much so, that I have for years abandoned it.

The local abstraction of blood, by leeches or the cupping-glass, is extremely serviceable in very many of these cases, either in addition to general blood-letting or singly. It should be resorted to in similar cases to those in which I have advised the general loss of blood; but, in which the symptoms are not so urgent or marked. I prefer the use of the cupping-glass, and believe that the best spot for its application is behind and below the mastoid process; the removal of six or eight ounces of blood is sufficient in most instances, at a time; and frequently, perhaps most frequently a less quantity suffices in the commencement of treatment, and before the influence of medicine can be established: cupping may be repeated with advantage under any augmentation of cerebral disturbance.

Both general and local bleeding may be, and often are carried to an injurious extent, by lessening power too much.

In children, delicate females, and very feeble persons, leeches would perhaps be preferable to cupping.

2. The observance of bodily and mental quietude is too obvious to need comment.

Diet must be proportioned to the strength of the patient, and urgency of the case ; generally, a moderate, mild, nutritious form is the best ; extreme abstinence is rarely required ; and sometimes, during medical treatment, even the use of stimuli, as beer, wine, or spirit may be essential.

Cases which are slow in their development and progress, such as result remotely from injury to the head, or are consequent upon fever, excess of mental labor, or are produced very gradually by suppressed secretion, discharge, or habitual disorder, seldom require loss of blood ; but are better treated locally by counter-irritants, as blisters, tartar-emetic, issues, or setons ; the two former modes of irritating are applicable to the cases resulting from injury to the head, fever or mental anxiety or labor ; and the more severe forms of issue and seton will be found most serviceable in such cases as have followed suppressed secretion or morbid action.

As a general rule, the medical man should endeavour to restore or promote the secretion or morbid action, which has been arrested, as the best means of subduing the cerebral disease.

3. The most powerful agent we possess for promoting or exciting absorbent action is mercury ; and this is the remedy most to be depended upon in effecting the desired purpose in the cases we are now considering ; the same caution and rules apply to its exhibition in these instances, that I have detailed as requisite in the treatment of choroiditis.

Of the influence of iodine I cannot speak with so much confidence ; but I consider it a very useful auxiliary in some cases.

I shall briefly recapitulate the principal points of treatment, and the application of its particular forms to particular cases.

In those which result from injury to the head, from apoplexy, from intemperance, from gluttony, from excess of anger, or from sudden suppression of secretion or morbid action, when urgent symptoms are present, and the disease has been sudden in development—

1. General bleeding ; abstinence ; purgatives ; perhaps cold to the head.

2. Local bleeding ; counter-irritation ; moderate diet ; mercury rather freely ; perfect quietude.

When the disease is more slowly developed and cerebral symptoms less marked, as remotely after injury to the head, or from excess in food, from mental anxiety, after fever, or from suppressed secretion or morbid action—

1. Local bleeding by cupping.

2. Counter-irritation ; moderate diet ; mercury more slowly ; quietude.

In the most insidious cases where the symptoms of cerebral disease are very slight, and the progress of the disease extremely slow, as from many of the above causes ; or from syphilis or scrofula—

1. Counter-irritation and attention to secretions, with moderate diet.

2. Counter-irritation ; mercury or iodine, separately or together.

When there is marked syphilitic taint, or decided strumous diathesis, the power should be maintained by good nutritious diet ; and mercury should be administered cautiously ; and, in many of these cases, I believe that iodine will effect more than mercury, or that it will materially aid the latter remedy.

I have seen so many cases, deemed hopeless, recover under steady and continued means, such as I have described, that I recommend them with confidence : it frequently happens, however, that little immediate good results, especially in the more slowly developed and insidious disease ; but I have found that a steady perseverance has accomplished that which a moderate trial of the remedies had given little hopes of. I have gone on with a careful alterative course, for months

together, when the power of the patient has allowed of it, and have occasionally succeeded when hope had almost disappeared.

There are three consequences of cerebral disease found with amaurosis, which are not much under the control of the remedies I have described, or indeed of any others that we are acquainted with ; they are, the serous effusion constituting hydrocephalus ; purulent effusion or abscess ; and some forms of tumors. The first is perhaps most readily distinguished, and may be frequently combated with success in the early stage ; but, after a certain progress, our remedies are of little avail. Counter-irritants and mercurials are, I believe, the most efficacious means.

In cerebral abscess the symptoms are often very obscure ; and I believe that if it could be recognized, nothing short of operation would afford much chance of safety.

Even more obscurity exists in the development of cerebral tumors, and there appears but little probability of ever forming an accurate diagnosis respecting many of them. I consider, however, that the treatment recommended for amaurosis from cerebral organic mischief, is that best adapted to prevent, retard, or subdue such morbid growths.

I have not had sufficient opportunity of seeing

and examining cases of softening of the brain, (*ramollissement*), to venture to express my opinion as to its treatment. I am disposed to regard it, most frequently, as a consequence of a continued asthenic condition; and shall have to relate a case, bye and bye, in favor of such opinion.

I have selected a few cases illustrative of the foregoing section, which I shall now describe.

101. A man, aged thirty-two, tall and of a dark ^{Case.} complexion, was admitted into St. Thomas's Hospital, under my care, in August, 1839. He stated, that about eighteen months previous, he was suddenly seized with giddiness, noise in the head, and that dark spots appeared before his left eye. In about a fortnight afterwards, he was troubled with flashings of light in the same eye; and, at the same time, he experienced great pain in the forehead, and at the upper part of the head, with tenderness of the scalp. Just before the commencement of the attack, he had undergone mercurial treatment for syphilis, in one of the venereal wards of St. Thomas's; he had quitted the hospital before the effects of mercurial influence had quite subsided; and, whilst at work, had been exposed to a heavy rain for several hours.

No regular plan of treatment was adopted; and in the course of six months, he had lost all useful vision with the left eye; and the right

became affected also in a similar manner to a slight extent ; and although he was submitted to a variety of treatment, the vision of the right eye gradually became worse, so that he was only able to distinguish light for several weeks before he came under my care.

I found the patient pallid, with an anxious expression of countenance, and a slow, labored condition of pulse ; there was much vacancy in his look, a very slight degree of strabismus existed, the pupils of the eyes were larger than natural, and the motions of the irides were very sluggish. He could with difficulty tell the position of the windows in the ward room ; he still complained of occasional giddiness, and pain principally at the upper part of the head, but it was not severe or continued. The appearance of flashes had subsided.

Finding the secretions of the patient in good order, I commenced immediately with mercurial treatment and counter-irritation, and prescribed one grain of calomel with half a grain of opium, night and morning ; some senna and salts occasionally ; and a large blister to the forehead, not to be kept open. I directed that he should have a good plain nutritious diet, and be confined to his ward.

There was soon evidence of amendment ; for about a week after his admission, he could dis-

tinguish the tickets hung near each patient's bed, and could guide himself about the ward with facility. The treatment was steadily continued; the blister being repeated whenever he had return of cerebral uneasiness; his mouth became sore, and the frequency of the mercurial dose was, therefore, occasionally diminished, as I did not wish to create severe ptyalism, so long as he appeared to improve under a mild action of the remedy.

At the end of October he could see to read the name of the surgeon on the patient's tickets, and to distinguish persons walking in the street below. In the early part of November he complained of considerable increase of pain in the head with giddiness; and his pulse had become much firmer and quicker than usual. I directed, in consequence, that he should be cupped behind the mastoid process, on each side: he lost about eight ounces of blood, which did not, at the time, materially relieve him; but in a day or two, the increased disturbance subsided. I believe that this increase of pain was owing to imprudence and excess in diet; it was, however, the only interruption experienced during the treatment of the case, which, by steady perseverance, has effected nearly all we could desire; his vision being now good for all ordinary purposes, though not sufficient to distinguish small

print, and his general health and appearance being much improved. (February, 1840.)

This patient is still under my care, and pursuing the same measures, by which I hope shortly to perfect the cure.

In the commencement of this affection I consider that there was a congested condition of the brain and of the choroid tunic of the left eye; and that, in a short time, congestion also affected the retina of the same organ; but, probably, some thickening or effusion in the brain, or its membranes was produced by a chronic inflammatory action; and, further, that under the continuance of morbid action, the right eye became affected, principally, by vascular congestion. I am of opinion that the morbid action in the eyes did not exceed a congested state; but that all inflammatory action was confined within the cranium: otherwise, the appearance of dark spots and flashings of light would not have subsided as the amaurosis increased; and there would have been evidence of organic disturbance in the eyes themselves; whereas, I could not detect any morbid structural appearance in any of the tunics or humors.

The case proves the inefficacy of irregular depletory treatment, and affords satisfactory evidence of the influence of mercury carefully and steadily administered.

102. I was requested by my friend and col- Case.
league, Mr. John Dalrymple, to meet him in consultation on the case of a gentleman, aged about twenty-seven, who was suffering from amaurosis. Whilst performing his professional duties, as lieutenant, on board one of her Majesty's ships, on the Mediterranean station, this gentleman had received a severe blow upon the head which incapacitated him for some time. The cerebral disturbance thus created, led, eventually, to the loss of vision ; so that, on his arrival in England several months subsequent to the injury, he could only distinguish light from darkness. When I saw him with Mr. Dalrymple, he was unable to discern the scarlet hue of his brother's coat, who was with him at the time of our visit, and in his regimental dress, being on duty in the immediate neighbourhood, at St. James's. Our patient had a vacant aspect, with strabismus ; and a dilated state of pupils, with indolent irides ; his walk was unsteady and irregular ; and his speech defective, shewing disturbance of great extent in the nervous system : he complained of giddiness and uneasiness about the head, but not of severe pain ; his sufferings, in this respect, had been great when the amaurosis first commenced.

There could be no doubt that the actual seat of the disease was in the brain ; but it was im-

possible to determine the precise nature and extent of organic mischief. We determined, however, to place the patient under a steady and continued mercurial course, but to watch him carefully; we fortunately secured a residence for him, so that Mr. Dalrymple had constant opportunities of seeing him. We began the treatment by giving him small doses of mercury with chalk, night and morning; and by allowing him a moderate plain diet without stimulus; and instituted counter-irritation by rubbing some tartar emetic ointment behind the ears: by degrees, we increased the dose of mercury, and, occasionally, varied the mode of counter-irritation, applying small blisters above the eyebrows. For many weeks, during which the patient continued under our immediate observation, a gradual and decided improvement took place; his articulation became distinct; his step more firm and steady; and he had acquired the power of discerning objects of moderate size, and of distinguishing persons in a favorable light. In this condition, he left town with the intention of persevering in the plan we had adopted; but was unable to resist the temptations of the hospitable board provided by a near relative, whom he was visiting; the consequence was, that he suffered two or three times some slight relapses; eventually, however, he did, with great perseverance follow

the directions he had received ; and has, in consequence, obtained very considerable benefit ; for he has recovered, in every respect, excepting distinct vision : he has regained sight sufficient for all ordinary purposes, and can with little difficulty read a common octavo print ; and this condition of vision has continued without interruption for many months.

This case illustrates not only the good effects of the mercurial treatment, but also shews how necessary it is that strict attention should be given to the dietetic means, without which, the proper influence of the remedy cannot be maintained.

103. My friend, Mr. Walker, of St. George's Case. Hospital, requested me to see a lady of about twenty-eight years of age, who was the subject of amaurosis, complete in the left, and nearly so in the right eye : the pupils were of different sizes, the left rather the larger, but not much dilated : the motions of the irides were very sluggish, and there existed a very trifling degree of strabismus. She was pallid, with cold extremities, and complained of great mental and bodily depression ; she was most easy when allowed to be perfectly quiet and reclining, but not perfectly recumbent ; her pulse was feeble and compressible, but not rapid. All these symptoms had come on shortly after miscarriage, attended with flooding, as she

said, to a frightful extent: so far, the case had the marked characters of the asthenic form; but the condition of the pulse, which I thought to be labored, and the existence of slight strabismus, made me hesitate and enquire further, when I discovered that she was very uneasy, when perfectly reclined, and, whilst in such position, that she suffered much from severe cramps in the limbs: I had, then, no longer a doubt of the nature of the case, and, immediately, directed her to be cupped behind the mastoid process; to begin the exhibition of mercury; and enjoined quiet, and a simple light diet.

The mercurial treatment was carried to an extent to affect the mouth, but not severely; her recovery was perfect in about six weeks. Had I hastily formed my diagnosis from the prominent features of the case, and taken, as a fact, the important statement about the flooding, I should have treated the patient as suffering from asthenic disease, and probably, have induced a fatal termination. I have seen many other cases in which a superficial view and examination might have led to most serious error.

Case.

104. I was requested, by Sir Astley Cooper, to meet him in consultation, on the case of a young married lady who had become amaurotic rather suddenly, with symptoms of cerebral mischief, indicated by severe headache, giddiness, cramps,

and disturbed rest. When I saw her, she was pallid, the extremities cold, and the pulse slow and labored, but not easily compressed : she had headache, with a vacant aspect, and the pupils of the eyes were much dilated and fixed : she had not the slightest perception of light, for I placed her near to a window facing the south, upon which the sun shone powerfully, and I admitted a broad ray of the brilliant light by partially opening the shutter, which had been previously closed : then by changing her position, each eye was successively subjected to the sun's ray, but she was not aware of its presence, nor did it occasion any change in the pupils. This perfect condition of amaurosis had, however, existed only a day or two ; she had previously lost blood, the secretions had been freely acted upon, and her diet had been spare ; still, however, the labored state of the pulse with the continuance of headache and cramp, when she was recumbent, induced me to recommend further depletion ; but, at the same time, I was anxious that she should be placed rapidly under the influence of mercury, as I considered that some cerebral effusion had taken place, which depletion, alone, could not relieve. Accordingly, she was cupped at the occiput ; after which, a large blister was applied ; calomel, in doses of three grains, with a small quantity of opium, was administered every

six hours ; besides which, some strong blue ointment was rubbed into the arm, and a simple farinaceous diet, alone, was allowed. In little more than eight and forty hours there was evidence of mercurial influence ; the gums being tender, and the breath offensive : about the same time, a favorable change took place in the most important symptoms ; she became nearly free from headache, the cramps ceased, her pulse increased in rapidity and volume, but was soft and compressible ; the extremities regained their natural warmth, and she could again distinctly perceive light. The mercurial treatment was, however, continued to the same extent until free salivation was established, and then the remedy was given only in sufficient quantity to maintain a moderate degree of ptyalism, which was kept up for about five weeks.

As the influence of mercury was established, her diet was improved, and throughout the treatment, care was taken to have sufficient action from the bowels. Within six weeks from my first visit to her, her vision was perfectly restored, and she expressed herself as feeling much improved, as regarded her general health ; and the beneficial effects of the treatment upon her system was satisfactorily evinced in a short time after her return home to the country ; for she soon became pregnant, whereas she had been

married between five and six years, but had not previously had any family.

The amaurosis had in this case resulted from cerebral pressure, probably, from effusion in the third ventricle, or near the infundibulum: although the amaurosis was complete when I saw the patient, I was sanguine as to a favorable result from mercurial treatment, because the disease had been rapid in its progress, of short duration, and the lady possessed sufficient power to enable us to use the remedies actively.

105. A stout countryman, aged forty-eight, was Case. brought to the Ophthalmic Hospital, on the 13th of November, 1838: he was completely amaurotic, being unable to distinguish light; the affection had occurred suddenly, and had been preceded by headache and giddiness, which indeed, continued up to the period when I first saw him.

A few weeks only had elapsed from the commencement of the attack when he came under my care: his aspect was then extremely vacant; slight strabismus existed; and the pupil in each eye was much dilated, and the irides nearly motionless; he had not experienced any unusual appearance of spot, spark, flashings, or other symptoms of choroid or retinal affection. I directed that he should be immediately cupped below and behind each mastoid process, to the extent of eight ounces; that he should be blis-

tered on the forehead ; and have a simple light diet. I prescribed two grains of calomel with one-third of a grain of opium, thrice a day, and an occasional mild aperient. After a few days, as mercurial influence was evinced, he began to perceive light, and improved so rapidly that he left the hospital to resume his work as a laborer, on the 18th of December, contrary to my wish and solicitation. Some slight imperfection of vision still remained, but I could not advise a continuance of the treatment, because he was about to pursue his labor exposed to the weather. He promised to return if he experienced any relapse ; and I was not surprised to see him again at the institution on the 26th of the February following. His appearance was much the same as on his first application ; but the amaurosis was not complete, for he could discern large objects : his general health was not so good, for he was depressed, and his circulation was feeble ; in addition, therefore, to the treatment before adopted, I prescribed some compound decoction of sarsaparilla, thrice a day ; and ordered a better form of diet. On the 20th of March, his mouth had become sore ; considerable improvement had taken place in vision ; and his general health appeared good. I directed the frequency of the dose to be diminished, and continued only to a sufficient extent to keep up the action obtained.

The vision was soon restored to the same extent as when he first left the institution: but we could not effect a further change: at least, the remedies were continued for several weeks without further improvement. He left the hospital on the 20th of April, but continued his medicines, &c., for some time afterwards. He has for several months past resumed his work, and his vision remains as good as when he left our care.

I believe the amaurosis in this case to have been produced by cerebral effusion, consequent on partial but acute inflammatory action, as evinced by the rapid destruction of vision, with an absence of other symptoms, indicating cerebral mischief of much extent. The result further confirms the efficacy of the mercurial treatment.

106. A man, aged thirty-six, stout made, and Case. employed as a clerk in a mercantile office, applied at the Ophthalmic Hospital, having paralysis of the third cerebral nerve on the left side; he was incapable of raising the superior eyelid by its proper muscle; and when I raised it by my finger, I found the cornea directed outwards and slightly downwards, through the influence of the abductor and superior oblique muscles, which alone retained power; the pupil dilated; the iris immovable; and the vision slightly confused. If the patient looked at any object directly before him, whilst the globe of the left eye was ex-

posed, a double impression resulted, and he saw two objects instead of one.

The affection had existed nearly a fortnight, and had been preceded by headache and giddiness ; it had occurred suddenly.

The secretions of the patient were in good order, but his circulation was labored, the pulse being slow and firm. I directed that he should be cupped below the mastoid process to the extent of twelve ounces ; that he should apply a blister to the forehead, and take a light farinaceous diet ; I prescribed two grains of calomel with a third of a grain of opium, thrice a day ; and half an ounce of the sulphate of soda occasionally as an aperient. After five days, mercurial action was established, but severe diarrhœa occurred with much pain ; I then omitted the mercury, and gave him six drachms of castor-oil, and twelve drops of laudanum, in some mint water ; and desired him to resume the calomel and opium each night, if the diarrhœa subsided after the action of the oil, which it did.

After a fortnight I found he had become depressed, and I therefore directed him to take a better diet, and prescribed fifteen drops of the solution of yellow bark, thrice a day ; up to this period the blisters had been repeated three times, and the patient had regained nearly full power of the levator palpebræ ; the strabismus was less ;

and the iris possessed some degree of activity, as the pupil contracted considerably on exposure to light. The treatment was steadily pursued; but in consequence of the general power remaining feeble, and the recovery of the eye being slow, I substituted a mixture of iodine and hydriodate of potash, with gentian for the solution of bark. The cure, though slow, was steady and completed in little more than two months.

From the symptoms of this case, it is evident that the disease was confined to the course of the third nerve, and, therefore, probably of small extent.

107. A lady, aged thirty, became the subject Case. of amaurosis; nearly complete in one eye, and imperfect in the other, a few weeks after miscarriage; during which, it was stated she lost a large quantity of blood; the amaurosis had been rather rapid in its progress. She was brought to London after several weeks had elapsed, and she had undergone rather active treatment, by cupping and mercurials principally; leeches and blisters had also been used, but the disease had advanced. I was requested to see her, and found her very pallid, with cold extremities, feeble, rather quick and compressible pulse, great despondency and prostration; slight strabismus existed; the right eyeball projected rather more than the left, and its visual power was almost

gone : the left eye retained sufficient power to distinguish large objects—the pupils were dilated and fixed ; a degree of numbness and loss of muscular power affected one side of the face, she suffered from constant dull headache, which was relieved, in a degree, when she assumed the recumbent position. The general symptoms, and non-effect of depletory treatment, connected with the history of the case, especially the circumstance of great loss of red blood, gave it the character of asthenic disease ; whilst the strabismus and partial paralysis of the face created strong suspicions of some organic cerebral disease.

I considered that there might be some partial serous effusion or softening about the brain, to account for the last mentioned symptoms, and yet the case be one of asthenic kind ; for I have no doubt that organic changes can, and do take place, and often with frightful rapidity, when the general power is much below par. Under this conviction, I prescribed for the patient, and was deceived by some degree of improvement ; for she became easier, and had more animation about her. After a short time, however, she again began to decline, and, in a few weeks, died with more evident symptoms of serious cerebral disease.

On post mortem examination, a large abscess

was found in the left hemisphere of the cerebrum, extending into the anterior and middle lobes.

I believe that the suppuration had commenced before I saw her; and that medical or surgical skill could have availed little, even with correct diagnosis. This, however, does not lessen the interest of the case, which presented a train of symptoms extremely complex, and which could very rarely be observed again. The patient was not in a state to give me any detailed account of her early symptoms: and the statement, received from her medical attendant in the country, was little more than a history of the treatment that he had adopted.

108. Eleven years since, a young woman, aged Case. twenty-one, applied at the Ophthalmic Hospital, having paralysis of the third cerebral nerve of the left side; being incapable of raising the superior eyelid, by its muscle; and having the globe abducted, and the cornea directed outwards and a little downwards; the pupil being dilated, and the vision rather imperfect, and double with the two eyes; or whilst the lid of the left was supported, by which the appearances I have described were detected. A nutritious diet, attention to the secretions, counter-irritation by blisters, and a moderate mercurial course, so

as to produce ptyalism, removed all symptoms of disease, in a few weeks.

Since then, this patient has had three more attacks of similar character, from imprudence in her habits ; but each time, she has obtained perfect relief by the same plan of treatment.

I have seen very many cases of ptosis, or paralysis of the third nerve ; and, with very few exceptions, a cure has been performed on the principle described in the foregoing case : those which have resisted the treatment, have been cases of long standing, in which depletory means without mercury had failed.

Case.

109. A gentleman, aged forty-six, and who had possessed great muscular power and mental energy, was brought to my house, in the following state :—

He was incapable of walking without support, and, even then proceeded with difficulty ; he had numbness of his arms and legs, and considerable diminution of muscular power in both ; his articulation was difficult and indistinct ; his memory was deficient, and he was impotent : he was amaurotic, the vision of one eye being quite lost, and that of the other very imperfect ; strabismus existed ; and there was paralysis of the muscles on one side of his face.

I found that these symptoms had been pre-

ceded by headache and giddiness; and, that they had commenced rather suddenly, and augmented rapidly.

The patient had been bled, cupped, blistered, purged, and had refrained from the use of stimuli, and partaken very sparingly of animal food, without experiencing relief; but he had become excessively feeble and depressed; his pulse was slow, but labored and very compressible.

All the circumstances of the case tended to prove, in my mind, that my poor friend was the subject of cerebral pressure; and, I therefore recommended a moderate nutritious diet, with a small portion of animal food, and half a glass of sherry with water daily, in consequence of his state of depression: that he should be kept perfectly quiet in body and mind, and should have the head and shoulders well raised when in bed; that he should be blistered on the forehead, and behind the ears, alternately; that he should use mercury in small doses, in combination with chalk, and also have some mercurial ointment rubbed into the arms; and regulate the bowels, by any mild aperient. The mercury was employed cautiously at first, and the dose gradually increased, as we thought the patients strength admitted, until the gums became tender, and the mouth sore, we then began to perceive signs of amendment, and as our patient appeared im-

proved in power, the mercurial was continued, in such quantity as to produce a free state of salivation ; but, at the same time, the quantity and quality of his food was augmented ; though he was obliged to take all in a soft or fluid form.

Very slight interruption took place in the course of the treatment, which was steadily pursued through several months, with such advantage, that my friend recovered in every respect, excepting one eye, which remained, with a slight degree of strabismus, and an imperfect condition of vision. The general and intellectual powers of the patient were perfectly restored, as well as sexual function ; several weeks after he had quitted my care, and had been in the country, he wrote to me, to say that he had walked above twenty miles without difficulty or fatigue, and that he was as well as he ever had been.

The general aspect of the patient in this case, when he first applied to me, indicated mostly an asthenic condition ; his pulse being weak, his look pallid, and his extremities cold ; but the commencement and progress of the symptoms were too distinctly marked to leave a doubt in my mind, as to the true character of the complaint.

I believe that a mistake in diagnosis which would have led to a tonic plan of treatment, would have been fatal to the patient.

Some of these cases may be usefully contrasted with others given in illustration of amaurosis from deficient power.

The next forms of amaurosis which I have to describe result, I believe, in most instances, from altered vascular action throughout the whole nervous apparatus of vision : they are not, at first, attended with any visible change of structure, and are, therefore, of a functional kind ; but, under a continuance of the disease, morbid alterations ensue.

I shall make two principal divisions.

1. That which results from excess of the vascular action, and which has received various appellations, as acute, tonic, sthenic, plethoric, congestive, &c.

2. That which is produced by a deficient action, or inadequate supply of red blood, and has been termed chronic, atonic, asthenic, &c.

FUNCTIONAL AMAUROSIS FROM EXCESS
OF VASCULAR ACTION.

THIS may arise from a general fulness and tension of the vascular system, or depend upon a partial turgescence or fulness, from irregular arterial action or venous congestion.

Symptoms.

When there is a general tension of the vascular system, the symptoms are usually well marked : there is general headache, giddiness, feeling of heaviness or torpor ; the amaurosis is most frequently of gradual development ; and the patient describes objects as if seen through a mist, cloud, or network ; and, sometimes, as invisible in part, parts, or entirely, without the intervention of a cloud, &c. The condition of vision depends, I consider, upon the principal seat of vascular pressure, differing, as I have before remarked, according as it may be cerebral, or choroidal ; there is also a sense of fulness about the head and eyes, with heat.

Appearances.

The eyes sometimes appear slightly protruded, the conjunctiva exhibits more red vessels than

natural: the pupils are, at first, often contracted; but, if the disease continue a few days, they become somewhat dilated, and the motions of the irides sluggish: the face is frequently flushed, and the patient either restless and anxious, or heavy and inclined to sleep; and, during sleep, he snores loudly: all these symptoms are increased after a full meal, or by position from which the cerebral circulation is augmented.

The skin is hot, and the pulse full, bounding, and incompressible.

Indulgence in the luxuries of the table with- Causes.
out due attention to the secretions, especially of the bowels, is the most frequent origin of the vascular fulness; and this effect is most prevalent in those who have sedentary occupations, and are prevented from taking exercise; now and then, the plethoric state results from two or three acts of excess in diet, in rapid succession; and then the symptoms are usually more urgent and severe.

The same condition of circulation with cerebral determination comes on more slowly, in consequence of arrest of inordinate secretion or discharge, or the suppression of some long standing or habitual disorder.

When the vascular system has become turgid from any circumstance, an amaurosis is easily promoted by much exertion of vision.

Persons
liable to.

This form of amaurosis is seldom found in very young persons ; it is much more prevalent about the middle period of life, than in persons of advanced age.

It usually affects both eyes in an equal degree.

Treatment.

Speedy relief is obtained, as regards the amaurosis, by lessening the tension of the vascular system : and this is best effected by the general abstraction of blood by venesection, so as to produce a decided effect on the circulation at the time : subsequent repletion should be prevented by great attention to the secretions and diet, in the cases which have arisen from excess of food or stimulus ; but in those instances, in which inordinate secretion or discharge, or habitual disease, has been checked or suppressed, an endeavour should be made to promote a return of the secretion, &c. ; or a drain should be established, for a time, by seton or issue, in addition to the remedies that I have previously mentioned.

The formation of issue or seton, at any part, will, I believe, produce the desired effect on the circulation ; but a more immediate relief may perhaps be afforded to the amaurosis, by placing a counter-irritant in the neck.

If the patient will not submit to the formation of issue, &c., he should be purged frequently and freely.

Cases of this class, from too great indulgence in food, are not uncommon.

110. A few years since, I saw a gentleman Case. who had become amaurotic, suddenly, after unusual indulgence in the luxuries of the table, for several days in succession. He generally resided in the country, and was extremely regular and moderate in his habits ; but came to London, for a short period, to visit some of his family ; when they, and his town friends, took the opportunity of evincing their hospitality, by a succession of invitations ; the gentleman did not like to refuse the invitations, or the solicitations to eat and drink much more than he usually did, for fear of giving offence : the consequence, was over distension of his vascular system, causing headache, giddiness, with sense of fulness in the eyeballs, and great imperfection of vision : the eyes appeared congested, and the pupils were dilated.

The loss of a few ounces of blood, by venesection ; the operation of three or four doses of active purgative medicine, with a spare diet, soon restored the patient to a comfortable state, and removed the amaurosis.

I have seen several patients suffering from amaurosis, in various degrees, which had appeared soon after the cessation of periodical or frequent loss of blood, from hæmorrhoids ; and

these cases have, in general, been soon relieved, by moderating the diet, and by keeping the secretions from the alimentary canal unusually free.

Case.

111. Last year, a lady called upon me, suffering from imperfect amaurosis, which had commenced soon after the sudden arrest of morbid secretion from the legs, from the effects of an astringent lotion; she had experienced a similar attack, from the same cause, about seven years before, from which I had succeeded in relieving her. I found her circulation too full, and symptoms of cerebral and ocular congestion: a few doses of active aperient medicine, and moderate abstinence, soon removed all cerebral and ocular disturbance; but I subsequently put a small issue in her left arm, which she has worn constantly since, and has not had any return of morbid action in the legs, head, or eyes.

Local
determination.

When the amaurosis results from increased cerebral circulation, or congestion, without a general fulness of the vascular system, the symptoms only vary from the foregoing, in degree, and in general character.

Symptoms.

There is usually headache, giddiness, sense of weight or heaviness in the eyes or forehead; the loss of vision is, in most instances, gradual, and occurs with much variety of cloud, gauze, &c. Further, the pupils are often, at first, contracted

and, subsequently, dilated ; and all symptoms are increased by stooping or becoming recumbent.

There is not, however, heat of skin, redness of eyes and face, or much general torpor ; and the pulse often indicates rather a feeble power, being quick and easily compressible, than too much force of arterial action.

The causes of this irregular vascular action Causes. are so numerous and various, that there must, necessarily, be some modifications of the symptoms.

Most frequently, the irregularity of circulation is sympathetic with gastric, hepatic, or intestinal disturbance, as in ordinary dyspepsia ; or when the stomach is disordered by improper diet, or by the influence of particular food ; or by some poison. Again, intestinal irritation from worms or scybala will produce a like effect.

With the gastric or hepatic disorder, there will, probably, be loss of appetite, nausea, uneasiness, tenderness at the epigastrium, with sallowness or yellow aspect, and depression of mental and bodily activity.

With the intestinal irritation, there will, usually, be found irregular state of bowels ; occasional nausea ; some abdominal uneasiness or tenderness with restlessness ; mental irritability ; and disturbed sleep, with horrid or distressing dreams ; and, sometimes, fever.

In many instances, however, when there exists gastric or intestinal irritation, the evidences of such mischief are so trifling, that it is often overlooked; and the cases are regarded entirely as cerebral; and improper treatment is consequently adopted and persisted in.

Case.

112. I was requested to see a young gentleman, thirteen years of age, who had been suffering, for many days, from headache of severe kind, giddiness, flushed state of countenance, and great restlessness and irritability; he was also intolerant of light, and his vision was very imperfect, being obscured by a gauze or web. I found the pulse rapid, small, but very compressible; the skin dry and hot; and the tongue loaded on the median part, by a thick light brown deposit; the edges being unusually red: the appearance of this organ induced me to direct my enquiries into the state of the secretions from the alimentary canal; and to examine the abdomen: I then learnt that the patient had been freely purged, principally, by saline medicines; but that the remedies had been directed to the head, under the supposition, that it was the seat of the morbid action: my examination of the abdomen discovered an irregular, indurated swelling in the right iliac region, which I considered to result from a collection of hardened fæces in the caput coli; I therefore

advised that the young gentleman should take, directly, a full dose of scammony and calomel, which, with the consent of his previous medical advisers, was administered: it produced a very copious discharge of hard scybala; the relief was immediate; all urgent symptoms subsided; and, after a second dose, he became convalescent—proving that all disturbance, cerebral, ocular, or other, emanated from the accumulation of scybala in the colon.

I have several times witnessed analogous cases in children, and have always found the tongue a correct index to the condition of the intestinal canal; and, therefore, indicative of the proper mode of treatment.

Some remarkable modifications of amaurosis Modifications. exist, which I consider as properly belonging to this division, because, in many instances, the symptoms of gastric irritation are well marked; and, further, in consequence of the disease being relieved, by remedies appropriate to gastric disturbance.

The modifications which I allude to are the marked intermittent varieties of amaurotic disease, sometimes irregular; but, most frequently, with regular periods of duration and intermission.

The most common of these varieties of the

disease is that, in which the patient has the vision obscured at sunset ; and becomes relieved of the obscurity at sunrise : usually, the patient loses the perception of objects of moderate size ; but, occasionally, retains only perception of light during the attack. From the patient being able to see during the day, the disease has been termed *hemeralopia*, from *hemera*, day, and *optomai*, to see.

OF HEMERALOPIA.

HEMERALOPIA is exceedingly common both in the East and West Indies ; and especially attacks the crews of vessels stationed off certain parts of the coasts or islands. It is most prevalent during the fruit season, and has frequently, (I think with much propriety,) been ascribed to imprudent indulgence in this tempting article of food, which produces gastric or intestinal derangement.

It is attributed, by the sailors, to the influence of the moon ; believing that it is produced by the moon-beams falling on the eyes, if they imprudently sleep exposed to them ; hence the disease is by sailors called moon-blindness.

The attacks of blindness generally occur, every night ; but there are variations in the periods of

relief; so that the disease puts on a tertian or quartan form, like ordinary intermittent fever: only one case of such variety has come under my observation and care; then the amaurosis occurred every second evening, or assumed a tertian form.

113. The patient, so affected, was about Case. middle aged, and had been some time in the West Indies, where he had been subject to the ordinary form of hemeralopia, becoming blind, or nearly so, each day at sunset; and, in consequence of the continuance of this affection, he resolved to return to England. On the voyage home, the disease became so far modified, that the attacks occurred every other night, instead of every night. He soon recovered by attention to his diet, and to his secretions; and by the use of quinine in doses of three grains, thrice in each day.

OF NYCTALOPIA.

OCCASIONALLY, the amaurotic symptoms take place at sunrise, and disappear at sunset; this variety is very rare, and has been denominated nyctalopia, from *nux*, night, and *optomai*, to see; as the patient has visual power during the night.

The variety of the disease which results from the influence of some poisons on the stomach or alimentary canal, presents modifications of symptoms, according to the quality and quantity of the poisonous matter introduced into the stomach, which I have not space to describe.

Treatment. In the ordinary cases of gastric and hepatic derangement, attention to the secretions, and strictly regulated diet and exercise, form the principles of treatment; the subject is, however, much too extensive for me to endeavour to explain further.

Remarks. Amaurosis from gastric and hepatic irritation, is most frequent in persons about the middle period of life, but it is not rare in those more advanced in age.

Disturbance of cerebral circulation, with amaurosis, from intestinal irritation, by worms, or scybala, is, on the contrary, rare in adults, and frequent in children, or young persons. The former usually occasion nasal and anal irritation, and frequently inordinate appetite; whilst the latter produce nausea, loss of appetite, and much general restlessness.

In children, between the first period of dentition and the time of puberty, these are the most frequent causes of amaurotic affection.

To remove ascarides or lumbricales, I know

of no remedy so efficacious as calomel and scammony ; or mercury with some drastic matter ; and a careful avoidance of green vegetables, fruits, &c. : turpentine, as a remedy for tinea, is so well known, as scarcely to need mention here.

To effect the removal of hardened fæces or scybala, two remedies may be employed, separately or conjointly, viz., purgatives and enemata: in my opinion, both may be used with much advantage ; but the latter, are especially serviceable when the irritating matter occupies any portion of the left part of the colon ; here, again, the best purgatives are those of drastic property : I have several times seen cases in which the purgatives, in common use, as senna and salts, rhubarb and magnesia, infusion of roses and salts, &c., have been employed, and have acted freely on the bowels for days together, without dislodging the offending substance ; and, subsequently, this has been effected readily, by one or two moderate doses of calomel and scammony, or calomel and jalap ; such instances must be familiar to all observant medical men.

The severity of the cerebral symptoms, in some of these cases, induces the medical attendant to consider the disease as existing there ; and the gastric or intestinal irritation, as sympathetic ; and it often requires a careful attention to the tongue, and to the character of the secre-

tions, as well as cautious examination of the abdomen, to form a correct diagnosis. Having seen frequent error, in this respect, I consider it a duty to notice it particularly.

In all the cases of hemeralopia and nyctalopia which have come under my care, (and of the former disease, I have seen numerous instances,) a cure has readily been effected by regulating the secretions, and pursuing a plan of diet, of nutritious but not stimulating kind; and when a healthy state of secretion has been restored, if the disease have not disappeared, a few doses of quinine or bark have speedily subdued it.

We have not much opportunity of seeing the severe forms of these affections; but the accounts we have from medical men who have witnessed it, in its worst degree, confirm the opinion I had formed, and have expressed respecting it.

Probably, from its occurring particularly off certain stations, and from its peculiar type, as well as from the influence of quinine in very obstinate cases, we may fairly infer that it frequently results from a specific cause, which, at the same time, stirs up disorder in the digestive organs.

I have known cerebral determination with amaurosis, sympathetic with two other conditions of distant irritation; as during teething, and during pregnancy.

Most medical men have witnessed the frequent cerebral disturbance which occurs during the period of dentition, and must have witnessed some of the distressing effects of the continuance of this disturbance. Amaurosis is one occasional consequence of such mischief.

From irregular vascular action, induced by uterine irritation, during pregnancy, similar effects sometimes result; and several remarkable cases are recorded.

The symptoms, in either instance correspond closely to those already described, as resulting from gastric, intestinal, or other distinct irritation; but, the disease is, in each case, limited to certain periods of life, during which, alone, the particular causes can exist.

I have considered these varieties worthy of separate consideration, because demanding some modification of treatment; thus, the irregular cerebral circulation which occurs during dentition, is speedily relieved by a free use of the gum lancet, with a careful diet, and regulation of secretions: whilst that which occurs during pregnancy usually requires little more than attention to the last named particulars, with, perhaps, occasional abstraction of blood, locally, by leeches; for the loss of a very small quantity of blood suffices to relieve any urgent symptoms; and, as the irregular vascular action cannot be entirely

subdued during the continuance of the exciting cause, it would be folly to pursue medical treatment, further than may be requisite to prevent severe or permanent cerebral disease.

Further, this form of amaurosis is, occasionally, produced from a more immediate cause, viz., from the pressure of some cervical tumor which impedes the circulation of the brain, by pressing upon the carotid artery or jugular vein. The tumors most frequently formed, in this situation, are glandular or aneurismal; but, sometimes, those of encysted, or adipose character, are developed.

Error in diagnosis is hardly possible, in such cases; and the mode of relief is obvious, though not always attainable.

FUNCTIONAL AMAUROSIS FROM DEFICIENT
SUPPLY OF RED BLOOD.

IN these cases, there always exists, I believe, a want of general power and vigor of circulation, at first : but, in some instances of long continued affection of this kind, the local circulation never regains its proper force and fulness ; and the supply of blood is inadequate to support the functions of the part, although the general system recovers its natural tone and power.

The disturbance of vision is gradual, and its Symptoms. degree frequently varies at first ; the patient generally complains of giddiness and headache ; and the pain is usually confined to the forehead, to the summit of the cranium, or to the occipital region : these symptoms are much relieved by quietude, by the recumbent posture, by a nutritious and slightly stimulating meal, or any thing that increases the power of circulation ; whilst they are augmented by immoderate exercise, abstinence, or whatever tends to lessen general power.

Appearances.

The pupils are generally dilated, and the motions of the irides slow; the conjunctiva and sclerotic have usually a blanched appearance; the face is pallid, and the patient has a distressed expression of countenance.

Generally, the patient is chilly; has cold extremities; is restless and watchful; and the pulse is quick, somewhat feeble and easily compressible; although the pulsation is accompanied, in some persons, with a marked jerk. Often, the patient is morbidly irritable and fretful.

Causes.

All circumstances which tend to exhaust the vital fluid, promote the asthenic amaurosis; as hæmorrhages, uterine, hæmorrhoidal, nasal, or from wounds; excessive secretions, as in menorrhagia, diarrhœa, or in seminal discharges, from inordinate venery or onanism; or too much or too long continued sucklings: profuse discharges from ulcers, &c., have a similar effect; as well as a deficiency of food, or bad food, and some poisons; and the operation of these causes is much augmented by hysterical diathesis, by influence of mind, &c.

Persons naturally of feeble power are most subject to this form of amaurosis, and it occurs most frequently between the period of puberty and the middle period of life.

Treatment.

Consists in first subduing or removing the

source of exhaustion, as by checking loss of blood, or inordinate secretion or discharge.

Suppression of hæmorrhage which is not extreme, can be generally accomplished with facility; but when it has been long continued, caution should be used in subduing it, and in subsequent treatment; or a state of plethora may be induced.

We but rarely find asthenic amaurosis as a consequence of exhaustion from diarrhœa, dysentery, menorrhagia or leucorrhœa. I have, however, known the vision affected under such circumstances; but the cases have been of trivial extent, and the amaurosis has quickly disappeared, as the cause of debility has been subdued.

On the contrary, asthenic amaurosis is frequent during lactation, either in young and delicate mothers, who have to support large infants, and endeavour to effect this entirely by the breast; or in such as prolong the period of nursing, in spite of exhaustion. In all such cases, the child should be taken from the breast, as soon as possible.

We have much more difficulty in suppressing the cause of exhaustion in those addicted to excess in venery, or to private gratification of sexual passion. There is something peculiar and almost indescribable, about the appearance of

persons debilitated from such causes, that I can detect the cause very generally, from the aspect of the patient; it is a mixture of anxiety, restlessness, and intolerance of society, which must be witnessed to be appreciated; this is particularly to be observed in those who practice self gratification.

In either instance, it is useless to attempt a cure, unless the patient refrain from his pernicious vices. The practice of onanism, (which often leads to much more serious disease than amaurosis,) becomes, in some instances, so confirmed a habit, that like dram drinking, the patient appears incapable of refraining from it; and, it becomes necessary to have him incessantly watched for months, before he can be cured of the unnatural propensity;—probably the effect of this vice upon the mental power, has much influence in lessening correct feeling, and destroying moral courage.

Excessive purulent discharge, which gives rise to asthenic amaurosis, is generally connected with extensive disease of bone, or proceeds from a largely exposed surface; and, it usually exhausts the patient, unless the diseased part can be removed by operation.

The debility resulting from deficiency, or improper form of food, has its obvious and certain remedy, except in very extreme cases.

Deficiency of red blood in the smaller vessels I consider to be the cause of diminution or loss of function in the retina, which occurs in very elderly persons, in whose eyes we cannot detect any organic change.

Rest, and the recumbent posture, tend materially to check cerebral mischief and amaurosis, in all of these cases. The cause of exhaustion being suppressed or mitigated, the next object of treatment should be, to restore power and maintain it.

This is to be effected,

1. By good nutritious diet: food should be taken at short intervals, in moderate quantity, so as not to overload a weak stomach; and a portion of stimulus, such as the patient has been accustomed to, will be serviceable, but it must be cautiously given, because under circumstances of much debility it is apt to produce over excitement, which is always prejudicial; when its exhibition is followed by flushing, restlessness, and headache, it should be laid aside for a time. In these cases there is often a relish for sour and indigestible food which should, of course, be forbidden.

2. By mental and bodily quietude, which are essential, as preventing further loss of power, and as aiding the operation of other remedies.

3. By medicinal agents, the best of which are

the preparations of iron, of zinc, of bark, of strychnine, &c. ; and, in some cases, narcotics, and anti-spasmodic or anti-hysterical remedies are necessary.

According to my experience, the preparations of iron are by far the most valuable of these remedies, as promoting the formation of red blood, and increasing the vigor of the circulation. I prefer small and frequently repeated doses to large doses. In very young and delicate patients I usually give the steel-wine ; and commence with doses of ten minims, and even less sometimes ; in those of more advanced age I employ the compound steel mixture, in half-ounce doses to begin with, or the sulphate of iron in substance in pill : and I have used, largely, a tartrate of iron, made by mixing fine iron filings with the crude super-tartrate of potash, (equal weights of each ;) the mass is covered with distilled water, and submitted frequently to alternation of heat and cold, being occasionally boiled, and afterwards exposed out of doors ; fresh portions of distilled water are added from time to time, and the whole is frequently stirred ; when the preparation has acquired a uniform dark redish brown color, it is fit for use ; of a saturated solution in distilled water, I prescribe from half a drachm to two drachms, twice or thrice in each day. The preparations of iron are espe-

cially serviceable in those cases which result from hæmorrhages, from menorrhagia, from excess of lactation, or from inordinate seminal discharge.

When the cure is tedious, I find it advantageous to vary the form of the remedy, occasionally, and to give it in combination with other preparations, as the sulphates of iron and zinc together, in pill or solution, or either, with the compound galbanum pill, or with ammonia, or other anti-spasmodic : these are useful additions when there is a marked hysterical diathesis ; and when excess of nervous irritability exists, hemlock, henbane, opium, &c., may be beneficially employed.

The occurrence of headache, or a sense of tightness about the throat, forbids the continuance of steel, or demands a diminution of the dose employed.

The preparations of bark are generally incompatible with the use of iron, but they are often of the utmost service in cases in which the latter remedy does not agree ; and some preparations may be combined with great advantage, as the sulphate of iron and quinine. I think the concentrated forms of bark the best in the cases we are now considering ; as the extract, the solution of yellow bark, (of Mr. Battley,) quinine, &c.

After diarrhœa or dysentery, or in cases of profuse purulent discharge, the preparations of bark are usually preferable to those of iron.

In some few cases I have employed strychnine in small doses as a tonic, (one-twelfth of a grain,) and with benefit. I believe that its specific effect, in larger doses, would be injurious.

The medical treatment must be modified according to the peculiar features of the case; the object is gradually to increase power, and promote the formation of red blood: the appropriate remedy must be selected by the medical attendant: it would be almost an endless, as well as useless task, (in my opinion,) to attempt to explain more than I have done in reference to the treatment of the numerous modifications of asthenic amaurosis.

I have already alluded to the close resemblance which exists between some of these cases, and those in which the amaurosis is caused by cerebral pressure; and the consequent liability to mistake in diagnosis and treatment. This point, perhaps, will be best illustrated by a few cases.

Case.

114. A young and delicate female, about seventeen years of age, having great nervous susceptibility, and disposed to hysteria, was accidentally thrown from a gig with her father, who was a very large man. She fell upon her father,

and was taken up without any mark of injury ; she was, however, dreadfully alarmed, and soon after attacked with a violent fit of hysteria ; several hours elapsed before she could be roused from this, under the use of the ordinary treatment, by stimuli, anti-spasmodics, &c. She then complained of excessive headache with giddiness, confused vision, and heat of head : the stomach was irritable ; she suffered from great mental depression, and could not procure sleep. Whilst in this state, her medical attendant, (believing that she had suffered some concussion of brain by her fall,) bled her ; she fainted after the loss of about eight ounces of blood, and remained a long time in a condition approaching syncope. In a few hours afterwards, her previous symptoms were renewed and became much aggravated ; the headache almost intolerable, the depression excessive, and the affection of vision increased ; so that in forty-eight hours after the venesection she could not discern light. A few hours after the amaurosis was complete, she was brought to me, still laboring under the symptoms last mentioned ; but, in addition, I found her pallid, with cold extremities ; and a quick, feeble, and easily compressible pulse : the result of the abstraction of blood was sufficiently indicative of the nature of the affection, and to prove its asthenic character. I directed perfect

quiet, the recumbent posture, small portions of nutritious matter to be given frequently, ten drops of the steel-wine to be taken in weak wine and water every four hours; and an occasional dose of the compound decoction of aloes with manna, and a few drops of aromatic spirit of ammonia as an aperient. In forty-eight hours from the time I prescribed for her, her symptoms were greatly mitigated, and she began to perceive light again: she soon recovered her ordinary condition of health, and lost her headache, feeling of depression, &c., but the functions of the retina returned very gradually; so that several weeks elapsed before she could tell the letters in the title page of a common octavo work; being so far restored, I lost all knowledge of her for several months, when she was again brought to me, nearly in the same state as when I first saw her; her father had failed in business, and she had suffered much from anxiety and privation, and had neglected all treatment. I put her under the same plan of treatment again, gradually increasing the dose of steel, and occasionally varying the form of medicine: her health was rapidly re-established, and a very slow improvement took place in vision: after many months careful perseverance in the above means, she obtained only sufficient vision to be able to make out a large print, I

subsequently tried blistering, electricity, galvanism, and strychnine ; but without any further benefit.

Connecting the early symptoms of this case with the fall, many medical men would probably have treated it in the outset, in the same way. Had there been a careful examination of the pulse and circulation, and had the condition of these been carefully viewed with the other symptoms, it would have been perceived that the cerebral disturbance could not be depending upon excess of vascular action ; the pulse which exists in cases of cerebral mischief from injury, is either quick, sharp, and incompressible ; or slow, labored, and of moderate force. I have never found, under such circumstances, the quick, feeble, and easily compressible pulse, which occurs in most asthenic diseases.

115. A gentleman, about thirty years of age, Case. tall, well formed, and strongly made, consulted me, in consequence of his being nearly blind, having only the perception of large objects.

Belonging to an opulent family, he had availed himself of the opinions and advice of nearly all the medical men of eminence in the metropolis, and also of several provincial medical men : all whom he consulted viewed the case as one of cerebral disease of sthenic character, and the remedies employed were local and general bleed-

ing ; all the varied forms of counter-irritants, cold lotions, shower baths, mercury, purgatives, abstinence ; and, in fact, all means calculated to lessen power and subdue any acute action. He only obtained some temporary relief from headache from loss of blood, but always had it in an increased degree soon after ; otherwise, he continued gradually to get worse. When I first saw him, he had amaurosis in the extent mentioned, severe occipital and cervical pain, which was constant ; he was giddy, he suffered from constipation and dyspepsia ; he was impotent ; and had numbness and deficient power in his legs and thighs, so that he could not walk steadily without assistance ; and he was incapable of making any great mental exertion : he had lost flesh considerably ; was pallid, with cold extremities ; and had a quick, feeble, and compressible pulse ; his symptoms were somewhat mitigated by a nutritious meal, and by the recumbent posture. I had no doubt, from these symptoms, that the disease was of asthenic character at that time ; but felt some doubts as to its mode of origin or commencement and progress, in consequence of the uniformity in the opinions of so many medical men of high reputation ; but a careful enquiry into the history of the case soon satisfied me, that the opinions previously given, and acted upon, had been formed too hastily

and erroneously. The patient, with good person and ample means, had entered the army when young ; and, as opportunity occurred, he indulged to excess in sexual intercourse—so much so, as frequently to render himself incapable of ordinary exertion, for days together ; after a few years, his sexual power began to decline, although the venereal appetite continued ; and he suffered from frequent nocturnal seminal discharges, when he was almost impotent in other respects : he then began to lose vision, objects appearing cloudy ; and he experienced frequent headache and giddiness ; the pain being generally about the occipital region : from this period, under various medical advisers, he was almost uniformly depleted ; and, by degrees, he acquired the melancholy train of symptoms, which were present when I first saw him.

I directed him to obtain apartments in a quiet situation ; to avoid all society likely to excite him ; to take exercise twice a day in fine weather, for a short time, not so as to create fatigue ; to clothe himself warmly ; and to recline on a sofa frequently in the day. His diet was to be nutritious ; animal food at breakfast and dinner, and a moderate quantity of wine with the latter ; the meals to be taken with great regularity ; to dine early, and to be careful not to distress the stomach by quantity of food ; he

was to use a shower-bath every morning on rising, from which he had previously experienced some benefit, feeling refreshed and invigorated from it. At first I prescribed small doses of the steel-wine, and then the sulphate of iron in substance in pill: afterwards, I added a small portion of sulphate of zinc to the pill, the doses were small and frequently repeated. A few weeks after he had commenced this plan a very marked improvement took place; the pains in the head entirely subsided; he experienced slight giddiness; the nocturnal seminal discharges became much less frequent; the dyspepsia diminished; he felt more general power and energy; and he began to discern objects about his room which he had no previous knowledge of. By a steady perseverance of more than twelve months, he was perfectly restored to health and sexual power; but he only regained sufficient vision to enable him to see a large print or letter; and, consequently, to guide himself about, and to recognize all ordinary objects, in a favorable light. Within twenty months from the time of my first seeing him, he married; and is now the father of two fine children; his health has continued excellent, and his vision has in a trifling degree improved.

I consider this as a highly interesting and instructive case, evincing the fact I have insisted

upon as regards the error in diagnosis, in these cases ; and proving the necessity of careful and extended enquiry, into the history and progress of disease. Several whom the patient consulted, I am satisfied, never would have committed such great error in diagnosis, and consequently in treatment, had they patiently gone into the history of the disease.

116. A gentleman, from the neighbourhood of Case. Shoreditch, came to consult me, having a very imperfect state of vision, and incomplete paraplegia, so that he walked with much difficulty—he was subject to headache, and giddiness, and pain in the lumbar region, especially after exercise ; and had a feeling of numbness in the extremities : his pulse was small, quick, and feeble ; his extremities were cold ; his face pallid ; and he was least distressed when he was recumbent : there was not any thing in the history of the case which could much influence my diagnosis ; but the principal symptoms indicated an asthenic state.

The patient recovered under tonic treatment, a generous diet, and careful regulation of the principal functions ; the tonic administered was steel.

117. A little girl was brought to me by an in- Case. telligent practitioner in the city, having complained, for some weeks, of imperfection of vision.

The child was pallid, its circulation was very quick and feeble; the extremities cold; and it had lost much of its usual energy; the pupils were dilated, and the irides possessed little motive power; the general secretions were in good order, having been previously regulated; and counter-irritation by blisters had been resorted to, without any good result.

The case being of asthenic character, I recommended a good nutritious diet, of light food, quietude, and attention still to the secretions; and I prescribed small doses of steel; after pursuing this plan, for a few days, the little patient appeared in better health and spirits; but the amaurotic affection did not subside; though, altogether, improvement was evident. Induced by the solicitations of some friends, the parents of the child took her now, to another surgeon, who deprecated the tonic plan of treatment, and advised depletory measures, as spare diet, purging, leeching, and blistering: the little patient, in consequence, got rapidly worse; and, in addition to the symptoms existing when I first saw her, she lost general muscular power, so as to be unable to stand; the amaurosis increased to such an extent, that little more than perception of light remained. The girl was once more placed under my care, and the mild tonic plan, previously advised, was again adopted, and the

patient began to improve ; the progress she made was, however, very slow ; and consequently, at the suggestion of Mr. S. Rix, who had brought her to me, I prescribed one-twelfth of a grain of strychnine in a drachm of tincture of orange peel and a little water, thrice in the day, instead of the small doses of steel : under the influence of this remedy, our patient improved rapidly, the appetite returned, the secretions became natural, the muscular power increased, and the imperfection of sight lessened ; and by the continuance of the strychnine, and a gradual augmentation of the dose to one-sixth of a grain, perfect recovery took place ; but without any of the peculiar or specific effects of strychnine being evinced.

I have since employed this medicine as a tonic, in small doses, in general and ophthalmic surgery, and in many instances with decided advantage ; but I have obtained no good from its use in large doses, so as to produce involuntary spasm, &c.

OF DISEASE AFFECTING THE FIFTH CEREBRAL NERVE.

Affection of
fifth nerve.

I HAVE seen three cases in which blindness resulted from disease affecting the fifth cerebral nerve, not altogether from influence upon the retina. I was led to recognize these cases, in consequence of having witnessed the effect of dividing the fifth cerebral nerve in the rabbit, according to the plan first practised, I believe, by the French physiologist, Majendie.

Case.

118. A little girl was brought to the Ophthalmic Hospital, with extensive ulceration of the left cornea, and a considerable degree of conjunctivitis; but the membrane was not injected as in simple or catarrhal ophthalmia; it had a dull red color, without the appearance of many distinct vessels; the ocular part was raised by subjacent deposit of serum, (*serous chemosis*;) the palpebræ were slightly swollen and red, and a muco-purulent secretion escaped from the palpebral aperture: the cornea generally appeared

dull, and a large ulcer of indolent character existed to the inner part, occupying more than a third of the surface of the texture.

The child was in a state of stupor, and evidently suffering from severe cerebral disease ; it could be roused with some difficulty, but it had not sense to enable us to determine, if any visual power existed in the affected eye.

I stated to the pupils my conviction, that the disease of the eye was produced by cerebral mischief affecting the fifth nerve.

The child was directly taken into the hospital with its mother, and I directed local bleeding by leeches, an active purge, and afterwards small and frequent doses of mercury with chalk, as well as free friction with mercurial ointment ; all our efforts were, however, unavailing ; the child gradually got worse, the left cornea was entirely destroyed, and the humors escaped ; the right eye became affected, as the left had been, and the cornea began to ulcerate ; but, before it was destroyed, the poor little patient became comatose and convulsed, and he died.

The post-mortem examination verified the correctness of my diagnosis ; extensive cerebral disease of acute kind was found ; and an abscess existed in connection with each fifth nerve, as it emerged from the crus cerebelli—similar abscesses had also formed just where some of the

other nerves were connected with the cerebral mass ;—there was besides considerable effusion of lymph and serum in connection with the arachnoid tunic.

Case.

119. A woman nearly forty years of age, came to the Ophthalmic Hospital, having ophthalmia and ulceration of the cornea in the left eye ; similar to, but not so severe as, that which I have described as existing in the last case.

Directly I examined the eye I was struck with the general appearance ; and remarked to the pupils, how much, in my opinion, the characters of the disease resembled that produced by division of the fifth nerve. Upon enquiry, we discovered that the patient had severe pains in the course of the supra-orbital, and infra-orbital nerves ; as well as along each jaw, and the tongue on the same side ; with also a degree of numbness to the touch ; the pupil of the affected eye was dilated, and she could only distinguish light. The woman further complained of intense pain at the posterior part of the cranium, towards the base on the left side ; and was generally indisposed—most of the principal functions being disturbed. Two or three days elapsed before we had corrected the errors in the principal secretions ; but in the mean time, the patient had been cupped on the neck, and had rubbed in mercurial ointment with opium freely over the

forehead and temple. When the condition of the alimentary canal permitted, I prescribed calomel and opium internally, and directed a good nutritious diet, with an occasional aperient; the mercurial friction being continued.

As soon as the mouth became affected, the pains diminished, the ulceration of the cornea became arrested, and the ophthalmia began to subside; and further gradual improvement took place under a continuance of the mercurial treatment, which was carried to such an extent as to produce profuse ptyalism; the general power being at the time supported by dietetic means, aided by tonic medicine.

The recovery was completed in little more than three months; the only evidence of disease remaining, was an opaque spot on the cornea, the cicatrix of the previous ulcer.

120. The third case occurred in an old woman, Case. who was a patient under my care in St. Thomas's Hospital, in consequence of fracture of the cervix of the femur. During her confinement, she complained of severe headache, seated principally at the posterior part of the cranium; and whilst this continued, one eye became affected as in the last case, but to a slight extent; the abstraction of a small quantity of blood, by cupping-glass, from the neck; and the exhibition of mercury, so as to produce tenderness of the mouth, soon

checked the disease, and by keeping up a very slight mercurial action for about ten days, all symptoms of disease disappeared. A small opacity formed on the cornea.

The old dame recovered tolerable use of the limb, of which the femur had been injured.

CONGENITAL AMAUROSIS.

MANY instances of congenital blindness are connected with mal-formation of the organ : they are evident and irremediable.

In some cases, the eyes are well formed, and even the functions of the iris perfect ; but no perception of light.

In others, with a well formed organ, there is a very imperfect function ; the distinction of light from darkness being all the patient is conscious of ; and, even this is lost, as the person advances to puberty.

It is very difficult, in the first few weeks, and sometimes for months, to tell, decidedly, whether a child be amaurotic or not, when the eyes are well formed ; but, all doubt is soon cleared up, when the period arrives, at which a child usually begins to take notice of surrounding objects ; for the aspect becomes vacant and unmeaning, instead of animated and intelligent.

When congenital amaurosis is imperfect, and

the child discerns light, and, perhaps, would be capable of seeing large objects, a remarkable involuntary motion of the globes is acquired, and is ever after retained—although complete loss of sight ensues: generally, it is a rolling of the eyeball; sometimes, a kind of oscillation; it is, I believe, acquired by the constant and eager search after light.

I believe, that all the congenital amaurotic affections depend upon deficient development, in some part of the nervous apparatus of vision; and that they are, consequently, beyond the reach of our science or art; they are occasionally confounded with cases of amaurosis from cerebral mischief, which are frequent in children, and often admit of relief, as I have described.

OBSERVATIONS ON AMAUROSIS.

I SHALL conclude with some brief observations upon the divisions and subdivisions of the subject, upon the pathology of the disease, and upon its treatment.

The division that I have adopted has been the result of very extensive observation and careful consideration, in which it has been my constant

endeavour to elicit practical good ; and I trust that I have exposed the general and principal symptoms, appertaining to each form of the disease, with sufficient clearness to render them intelligible to the well-informed practitioner.

It must be understood, that I have confined myself to the description of those forms of amaurosis most generally met with ; and have endeavoured to mark the boundaries of each form. There are however, frequently, combinations and modifications occurring, which I have not yet worked out sufficiently to make their introduction here of much utility ; they are, indeed, like the combinations and modifications of many other diseases, of such variety and often of such intricacy, that, I believe, only very few will admit of distinct and useful exposition.

The subject, altogether, is, in my opinion, far from complete ; and I think it probable, that further observation and experience may induce me to modify the present arrangement.

I do not pretend to any merit or novelty in my arrangement of the subject : it partakes of many that have preceded it ; though, I believe, it does not resemble any one altogether.

On the pathology of amaurosis little can be said, for little is positively known : various morbid changes have been discovered in the retina, the optic nerve, and in the cerebral part of the

nervous apparatus ; but these discoveries have, for the most part, taken place at a period remote from the occurrence of the amaurosis ; and we rarely have opportunities of inspecting the condition of these structures, anatomically, in cases of recent disease ; therefore we cannot accurately decide upon the exact changes which produce several forms of amaurosis.

Many of the changes in structure, which we find in our examinations of amaurotic cases, I believe to be the effect, and not the cause, of the loss of vision ; this happens especially with respect to the optic nerve, which nearly always loses its natural character, under continued amaurosis which has been of cerebral or retinal origin ; the performance of its appropriate functions appears to be essential to preserve the integrity of each part ; and if the function be annihilated, the part usually undergoes some alteration. The result of post-mortem inspection of cases of amaurosis would lead us to suppose that atrophy of the nerve was the most common cause of the disease ; but, I believe, that we should greatly err, in coming to such conclusion, solely from the fact observed, so frequently, in the dissection.

Further, the changes discovered after death in the retina, or in the cerebral portion of the nervous apparatus, may be produced by morbid

action, subsequent to the amaurotic disease ; in fact, the truth can only be obtained on these points by careful examination of these structures, during the progress, or at the completion of the amaurosis ; and our opportunities of doing this are so rare, that a very long time must elapse, before any positive conclusions can be formed. These circumstances must retard the progress of our enquiries, and our endeavours to perfect this division of ophthalmic diseases. I fear that we shall not comprehend some of the more intricate cases, until recent dissection shall have much advanced our pathological knowledge of the disease. It is true that in a great majority of amaurotic complaints, a careful enquiry into the history and symptoms of the cases enables us, confidently, to form our opinion of the seat and nature of the disease ; but there are many cases which are obscure, from our ignorance of the nature of some of the pathological changes.

I have but slightly mentioned, or in some instances have altogether omitted, to notice many general local remedies which have been strongly recommended by others, as serviceable in the cure of some forms of amaurosis ; the reason is, that I have tried them, and found them almost useless.

As general remedies, I may mention phosphorus, arnica, strychnine, emetics, &c. ; the two

last I have described as serviceable in some instances ; the former, as a tonic in small doses, in asthenic cases ; the latter, as useful in some cases of irregular circulation, with gastric irritation.

I have frequently tried the influence of strychnine in cases of amaurosis, which I considered most appropriate for its use ; but, I have been very greatly disappointed in its effects ; I have not seen one single instance of benefit from its employment, in the manner generally recommended. I have, indeed, tried it in various ways, externally, and internally ; and have continued it, till the involuntary muscular contractions have been frightful, but without advantage to the amaurosis. In small doses, as a tonic, I have given it with good effect.

There are many cases in which the power of the retina is slowly restored, when the cause of the amaurosis has been subdued ; as, after concussion of the globe, after cerebral disease, or pressure on the optic nerve ; the recovery is promoted, in such instances, by stimulants ; as electricity, galvanism, ammoniacal vapors, blisters, &c. ; probably strychnine might aid equally : but I am satisfied that its effects have been greatly overrated ; and that serious mischief has resulted from its indiscriminate use.

A fair and careful employment of veratria,

has brought me to similar conclusions respecting its efficacy.

The use of stimulating vapors, lotions, ointments, drops, &c., to the eyes ; or the employment of pungent and irritating snuffs, may relieve a little, by creating a discharge in some cases of organic or congestive ocular amaurosis ; but they do not, as far as I have seen, produce so good an effect as a small blister to the brow. Electricity, galvanism, magnetism, &c., which I have tried extensively, are feeble aids in relieving amaurotic diseases ; I have rarely seen more benefit than some trifling acceleration of recovery, from their employment.

In my observations upon this subject, generally, I have remarked the following circumstances, some of which have been previously noted by others.

That amaurosis from organic disease, without violence to the retina, generally attacks the eye with dark colored iris ; that it affects females more frequently than males ; that it seldom confines its ravages to one eye ; that it occurs in elderly persons ; and that there is often hereditary disposition to it.

That amaurosis from disease in the choroid coat, occurs most frequently in persons with light colored irides, of feeble power ; especially in those

of scrofulous diathesis, and that it appears during the early period of life.

That all occupations which require continued application of vision to minute objects, and especially such as are altogether sedentary, tend to promote congestive and organic amaurosis.

That I have never been able to trace the disease to the influence of stimulating or irritating vapors or gas on the organ.

That I have seen a congestive form of the disease, of metastatic character, in gouty and rheumatic persons, but it is extremely rare.

In connection with the subject of amaurosis, I feel compelled, in honesty and justice, to offer my warmest thanks to Dr. Farre, for his able guidance and assistance, during my investigation of the disease; and for his liberality and kindness, in giving me most freely, at all times, the result of his extensive experience, and close observation.

OF DISEASE OF THE VITREOUS BODY.

DISEASE of the vitreous body independent of affection of any other tunic or humor of the eye, I believe to be exceedingly rare ; but this structure usually participates in morbid action, of an acute or chronic kind, that commences and continues in the retina, as I have described.

I have only seen one well marked case of affection of the vitreous body simply.

121. A young woman, aged twenty-seven, short, Case. dark, and stout made, applied at the Ophthalmic Hospital, five years since, having defective vision, which had come on gradually, and increased so as to incapacitate her for her duties as a housemaid ; she had not experienced any local pains, nor had she perceived any muscæ, sparks, or colors ; she was out of health, the bowels being irregular, the appetite bad, the tongue foul, the rest disturbed ; and she felt depressed ; her pulse was regular and tolerably firm ; and the uterine functions well performed. The vision of the left

eye was so much disturbed, that the patient could only discern large objects with it; whilst, with the right, she could recognize persons in a favorable light; but she could not read, or work; she saw best in a strong light; and without a good body of light she could not see to guide herself; both pupils were dilated more than natural, the left most so, and the motions of the irides were sluggish; the left pupil was not circular, but elongated a little in a direction upwards and inwards; the space of each pupil was dull, apparently from slight turbidity of the vitreous body or fluid; and an opake spot could be distinguished in each pupil, of a dull and dirty green tinge, which varied its position according to the incidence of the light, similar to that which I have described as appearing in glaucoma: the spot in the left, was more marked than that in the right eye.

I first directed my remedies to correct the state of the secretions of the digestive organs, which were much disordered; and this was accomplished, in a few days, by some doses of mercury followed by saline aperients; and by strict attention to a light farinaceous diet. Afterwards I prescribed a mild alterative course, with occasional counter-irritation to the forehead by blister; and succeeded, by these means, in subduing all morbid appearance, in the course of

two months ; when the young woman returned to her situation. I have seen her several times since, when she has been slightly indisposed, but she has not had any return of disease in the eyes ; nor is there any thing in them to indicate the existence of the previous disease.

The absence of supra-orbital pains, and the non-appearance of sparks, or colors, or muscæ, induce me to consider that the disease, in this case, was confined to the vitreous body ; and this opinion is further confirmed, by the perfect relief the patient obtained, and the little disposition to relapse evinced.

I consider this the most appropriate place to offer some remarks upon feigned blindness, or sham amaurosis : and shall afterwards treat of the subject of strabismus, or squinting, as in some measure connected with amaurosis.

OF FEIGNED BLINDNESS.

AMAUROSIS is a disease which is very often feigned ; and much difficulty occurs, in some cases, in detecting the attempt at imposition. In all these instances, both eyes are said to be affected ; though, perhaps, one is described as most defective ; for the purpose, intended by the feigner, would rarely be answered, unless all useful vision were supposed to be lost. Further, the eyes have generally a perfectly healthy character, in appearance, in the action of irides, and in the feel of the globes ; unless the party be acquainted with the effect of belladonna, or some other of the narcotics, which produce a similar influence, and have employed some, previously, to produce a dilatation of the pupils ; this much increases the difficulty of detecting the imposture. The classes of persons who feign in this way are children, and apprentices, to get relief from tasks or work ; or the latter to get free from an employment they dislike ; soldiers and

sailors, to obtain a remission of duty ; members of benefit clubs or societies, in which liberal assistance is afforded, to sick members. Now and then, I see a case in which I cannot detect any reason for the attempt to impose.

I shall, first, detail the most marked difference between these cases, and cases of actual disease ; and, afterwards, the modes of detecting the feigned disease.

Unless the belladonna, or some other preparation which produces like effect upon the iris, have been applied, the eyes of the impostor present their ordinary and healthy characters ; but there is usually some degree of assumed vacancy ; and, occasionally, this symptom is well imitated.

In what cases of amaurosis does the eye preserve a healthy character, and the iris a free motion ?—In some cases of congenital disease, and in the cat's eye of Beer, in which the morbid appearance is very difficult to be detected, without a previous knowledge of its existence ; but with this, and with a dilated pupil, and modified light, it can be seen at pleasure.

The history of the case, and careful examination, would readily decide on either of these points.

In amaurosis from cerebral disease, we have occasionally an active iris, but very rarely so ;

generally, the pupils are more or less dilated, or one is so ; or some degree of strabismus exists. I have never seen a perfect case of amaurosis from the cause mentioned, without some loss of power in one or both irides : here again the history and progress of the case will usually elicit the true disease.

All the other forms of amaurosis when perfect, are attended with some organic change, or interruption of function in the iris, or appendages of the eye, which cannot be feigned ; and are not, therefore, likely to be mistaken.

The detection of the assumed disease may very often be made in getting the history of the case, (provided the patient be allowed to tell his own story, which I consider best in all cases, at first ;) for he is rarely sufficiently conversant with the ordinary symptoms, to make a correct case : he will, probably, describe symptoms, which are incompatible with each other, or such as could not exist, without other evidence ; or some material errors may be detected by the well informed medical man ; at all events, by this means we gain much to lull or increase our suspicions. After this, an accurate examination should be made of the eyes without, and with, the aid of belladonna, to dilate the pupils ; for, unless the disease have been of long standing, or the belladonna, or other matter producing

the same effect, have been previously used, the pupils will dilate from the use of belladonna, further than apparent when first examined ; this may then enable the medical man to judge whether the pupils have been acted upon by medical means, or not, to aid imposition.

During the explanation of the patient, and the examination of the eyes, do not, if possible, excite his suspicions of your opinion of any attempt at imposition ; but rather endeavour to obtain his confidence, by a little well-timed pity, and agreement with his account ;—you may thus often disarm him ; while, otherwise, by creating suspicion, you alarm him, and he is constantly on his guard ; if he be unprepared, the sudden approach of the finger, or any extraneous matter, to the eye will cause a sudden blinking, if there be not amaurosis ; or you may observe that his eyes turn quickly to any one you may address ; or if you attract his attention mentally, he will perhaps, unintentionally, be induced to direct and fix his eyes upon your countenance, as a person in earnest conversation usually does.

When suspicion is excited, or when the party is well upon his guard, it is sometimes very difficult to prove the existence of visual power ; but I have seldom failed to do this satisfactorily by perseverance.

I have succeeded immediately by the following

means :— during conversation, dropping some small object, as a knife or pencil, suddenly, which has been immediately picked up by the patient ; pretending to see something in the room, or out of the window, (if near,) of curious or unusual character, the patient has been unguarded, for a moment, and his eyes have followed the direction I have pointed to : asking how the patient's dress became torn or soiled, his eyes have immediately been directed to the part mentioned or pointed to : and several other like expedients.

Case.

122. In one case, of a little girl, which baffled me for two or three weeks, during which period she had been strictly watched, but nothing elicited, I was engaged in conversation with her about her medicines, which she had much abhorrence of ; and, after trying to persuade her to take them well, I said I would give her sixpence if she promised to do so ; she assented, and I held out a halfpenny towards her, which she directly said, (without touching it,) was not a sixpence : she had previously sat, for hours together, without moving ; and would allow me to place my finger, or other matter, in contact with the cornea, without flinching.

Children generally sham blindness badly ; and can be pretty easily detected, by keeping them on short allowance for a few days, and then placing some tempting food in the room with

them, and leaving them for a little time alone ; and this plan often succeeds with adults. Few persevere for any length of time in feigning total blindness, as they cannot bear the restraint it imposes upon them.

An imperfect amaurosis is sometimes pretended, which it requires much judgment to decide upon ; the history of the case, and integrity of the organs are the best tests to guide the professional man.

OF STRABISMUS.

Definition. A LOSS of parallel action in the two eyes, so that the axis of vision in the two has not the same direction ; *strabizo*, to squint.

Symptoms. Usually one eye only is affected, and its motions do not correspond to those of the other eye which is under the control of the will, and, therefore, that which is exercised or used by the patient.

The eye affected by strabismus is usually deficient in visual power ; and, if the disease have been of long standing, the state of vision is often very imperfect and useless.

The affected eye is sometimes drawn inwards, or inwards and a little downwards, so that the cornea is directed towards the nose ; or, in other cases, it is turned outwards, or outwards and slightly downwards. I have never found the morbid position to be either directly upwards or downwards. The pupil of the misdirected globe is usually rather enlarged, sometimes greatly so ;

though I frequently find it as that of the perfect eye, and have seen it smaller: the motions of the iris, in most cases, are not so free as in the sound organ, which is not discovered, unless the eyes be examined separately. In slight cases of recent origin there is not much change in vision, or in the state of the pupil, unless a condition of amaurosis, from cerebral or orbitar mischief exist, in addition to the strabismus. These points will be further explained, in considering the different forms of the disease.

Strabismus is often congenital, and, probably, Causes. results from defective muscular or nervous development.

It is frequently the result of habit, or imitation, in children; and it arises from involuntary, irregular, muscular action in children and young persons, of weak power and unusual nervous susceptibility.

It is sometimes occasioned by disturbance of the cerebral circulation, consequent upon, or sympathetic with, distant irritation; as of stomach, bowels, &c.; or of the gums, or during dentition.

It is produced by injury or disease which disturbs or destroys the power of a motive nerve, or of a muscle of the globe.

CONGENITAL STRABISMUS.

IN these cases the cornea is most frequently drawn very much inwards, or inwards and downwards; and the extent of motion outwards is usually very limited, as if the abductor muscle or its nerve were deficient. The vision may be at first as perfect as that of the other eye; but when the patient arrives at an age to be able to express feeling, &c., correctly, the eye, affected by strabismus, is found to be very defective in power; and this arises from its having been very little, if at all exercised.

Treatment.

Medicine or surgery is of no avail, in these cases, as it cannot supply the deficiency of nerve or muscle. It has been proposed that the adductor muscle should be divided, so as to allow of the cornea to be directed forward: if such effect were to result from the division of the muscle, all the good that could arise would be a little improvement in the general appearance; for the motions of the globes would not correspond, because the muscular supply would not be the same.

I would not recommend surgical interference, in such cases.

OF STRABISMUS FROM IMITATION OR
HABIT.

THE love of imitation, which is so frequent in children, is very often productive of this and other defects ; and it is not uncommon to find that a child suddenly acquires a squint, or a habit of making faces, or of assuming a peculiar gait, without any pain or uneasiness, or any derangement of important function, or disturbance of health. In such cases, by observing the ordinary associates of the little patient, the cause may be often detected ; inasmuch as some one frequently with the child will be found to have a defect, similar to that evinced in the child. In these instances, as regards strabismus, the squint is not at first permanent, but it gradually becomes more frequent, and eventually continual. I have seen many cases of strabismus, of this kind, in children, brought up by a nurse or parent having such defect.

This form of the disease usually admits of re- Treatment.
lief, by withdrawing the child, for a time, from the influence of the defective party ; and, further, by compelling the patient to employ the eye which has had its proper motions dis-

turbed : by the latter plan, a healthy and proper action may be soon obtained ; and by the former, the desire of imitation ceases, as the object which has created that desire is withdrawn.

If the strabismus have not become permanent, it is sufficient to obscure the best eye for half an hour, or an hour, at a time, occasionally, in the day ; as when reading or writing, and to repeat it only when the strabismus recurs. When the disease is permanent, the sound eye should be covered more constantly, until the error in the muscular action be corrected.

OF STRABISMUS FROM NERVOUS INFLUENCE.

Symptoms.

THIS form of the affection usually occurs in children of delicate form, of weak constitutional power, but possessing a high degree of nervous susceptibility ; and, frequently, of unusual intelligence ; especially when they become subject to derangement of the digestive organs. The squint is rarely constant, and generally subsides when the child is tranquil, or free from excitement ; and when the more important functions are properly performed, or when the health is good ; and the disease becomes more frequent

or continued, as the child is more excited, or subject to derangement of important functions, or fatigued by mental or bodily exertion : it corresponds very much to, and is often connected with, involuntary action of muscles in other parts of the body, to which the term *chorea* has been applied. I have usually observed also, in these cases, that irregular muscular action is not always the same ; or that the direction of the strabismus varies ; and that it affects one eye for a short time, and then influences the other.

First, the surgeon should ascertain the visual Treatment. power of the two eyes ; and, if he find one defective, he should occasionally cover the other, to compel the patient to use the weaker one, so as to prevent further loss of power in the retina ; and to increase the defective power, by exercise. At the same time, he should, by medical and dietetic treatment, correct error in any important function, and promote and maintain a good degree of general power. The diet should be plain and nutritious, without stimulus. The exercise should be regular, but moderate, not to create fatigue. The clothing should be light, but warm, and the scholastic duties very light, and the patient should be kept from excitement both of mind and body. If a tonic medicine be required, which is frequently the case, the preparations of steel will, I believe, be found gene-

rally serviceable. As the cure of the strabismus depends, principally, upon the promotion and maintenance of a good state of health, it may easily be conceived how tedious these cases may be. I believe, however, that strict attention to the principles I have stated, will seldom fail to produce the desired effect. I have watched some cases for more than two or three years; and have, eventually, succeeded in effecting a cure.

On commencing the treatment, the parents of the patients should always be informed of the difficulty and tedium of the cure; and also of the liability of frequent relapse, depending upon the disturbance of the general health.

Sympathetic.

Almost every medical practitioner is familiar with the cases of strabismus, which arise from irritation in the alimentary canal, or from dentition; most of such cases are of trifling extent, and of short duration; being relieved by a brisk aperient, or by lancing the gums.

Cerebral.

The strabismus, in these instances, is caused immediately by the irregular cerebral circulation, which results from the distant local irritation; now and then, when the source of irritation is overlooked, or the case is neglected, cerebral disease supervenes, and effusion takes place, producing paralysis of ocular or other nerves,

from which the patient rarely recovers perfectly. Such cases require the same plan of treatment, as the cases of amaurosis caused by cerebral disease of inflammatory character. *Vide Organic Amaurosis from Cerebral Disease.*

Numerous plans are recommended for the Remarks. cure of strabismus,—they consist principally in the application of goggle-glasses, patches, &c., over or near the affected organ; they are all, in my opinion, useless; and I believe, that all cases, in which strabismus subsides whilst such means are employed, would get well without.

The proper principle of treatment is, first, to remove the cause which affects the muscle or muscles; and, then, to exercise the eye and muscles, so as to restore their power; when the strabismus soon disappears.

When it is necessary to cover one eye for a length of time, I direct a piece of cork to be cut into an oval ring, so as to fit against the brow, on the side of the nose, on the cheek below the inferior lid, and on the temple; in fact, so as to rest over the margin of the orbit, and not upon the lids or globe; the ring should be about half an inch thick, and should be covered in, on one surface, by a double silk, with a piece of thin pasteboard between, so as to exclude the light perfectly; the cork itself should also be covered

with silk : the other surface of the ring then left free or uncovered, should be placed next to the globe, by which all pressure on the globe will be avoided ; the shade is to be tied on the part by strings attached to each end, and secured at the back of the head.

OF THE ANATOMY

OF THE

CRYSTALLINE LENS AND ITS CAPSULE.

THE crystalline lens has been named from its resemblance to crystal, in its transparency ; to a magnifying glass or lens, in its figure.

The lens is beautifully transparent in its natural state, and offers two convex surfaces, one anteriorly, the other posteriorly; the latter generally has a much greater degree of convexity, than the former.

It is contained within a proper capsule; and is situated behind the iris, in front of the vitreous body.

The bulk of the lens varies much in different individuals, so indeed do the surfaces ; the convexities being in some much greater than in others. The average thickness of the body is about two lines or rather less ; and its diameter is usually between three and four lines.

The consistence of the lens gradually augments in density from the surface to the centre ; being nearly fluid at the surface, where in contact with the capsule ; and about the consistence of softened horn in the centre. Many consider that a fluid exists immediately within the capsule, which was first described by Morgagni, and is called the *Liquor Morgagni*. I much doubt of the existence of this fluid during life ; for if the structure be examined shortly after death, a very trifling quantity will be found ; but if the examination be delayed, a much larger quantity will appear—being, in my opinion, the result of a post-mortem change. I think that a perfectly fluid circumference would be incompatible with the admirable function of the body ; but I believe the exterior of the mass to be nearly fluid, only possessing sufficient consistence to maintain the more dense centre in proper position.

The lens is composed of a number of concentric laminæ, like the layers of an onion. The laminæ are intersected by radii which pass from the centre to the circumference ; these radii become apparent when the lens has been macerated for a few days in dilute spirit of wine. The laminæ are composed of extremely delicate fibres or threads ; and the whole structure is probably supported by a fine cellular tissue.

The chemical analysis of the lens, according to Berzelius, affords

Water	58.0
Peculiar matter	35.9
Hydrochlorates, lactates, and animal matter soluble in alcohol	2.4
Animal matter only soluble in water, and phosphates	1.3
Insoluble membranous residue .	2.4
	<hr/>
	100.0

The refractive power of the different layers according to Sir D. Brewster, is

Of the outer layers	1.3767
Of the centre layers	1.3990
———mean.	1.3839

The capsule of the lens is exactly adapted to the body which it encloses—the posterior, or more convex portion, is received into the concavity in the anterior part of the vitreous body; and is slightly connected to the hyaloid membrane: the anterior portion of the capsule is opposed to the posterior chamber of the eye, but is covered by the membrane of the aqueous humor; the circumference of the capsule is firmly connected to,

or continuous with, the striated membrane which forms the anterior part of the *Canal of Petit*.

There is a great difference in the consistence of the two portions of the capsule of the lens; the anterior portion being much thicker and firmer than the posterior; and it also possesses a high degree of elasticity.

The lens receives its vascular supply from a branch of the central artery of the retina; from some branches of the vascular layer of the retina; and from the vessels of the ciliary processes; the branch from the central artery passes through the vitreous body to the posterior capsule of the lens, and sends out, over this part of the capsule, numerous radiating branches which pass towards the circumference, and no doubt send minute divisions into the substance of the lens itself; the minute ramifications from the arteries of the retina, and from the ciliary processes, pass to the circumference of the anterior portion of the capsule, and probably supply this part of the membrane, and also the anterior part of the substance of the lens,—but I believe that the lens itself derives its principal supply from the posterior branch, derived from the central artery of the retina.

The circumference of the capsule of the lens is bounded by a triangular shaped canal, which was first described by Petit: internally, the space

corresponds to the circumference of the capsule ; posteriorly, to the hyaloid membrane of the vitreous body ; and anteriorly, to the membrane of the zonula ciliaris.

The crystalline body performs a most important office in the eye, by producing a convergence of the rays of light which enter through the pupil, so as to concentrate them upon the retina.

The density of the exterior of the body being less than that of the centre, as I have described, the refractive power is less in the former than in the latter part of the lens : this probably corrects the error which exists in all artificial lenses in consequence of the uniform density of their composition ; and which is termed the *aberration of sphericity*.

I am of opinion, that the adaptation of the eye to near and distant objects, is effected by some change in the convexity of the crystalline body ; but I have not now, however, space to state my reasons for this opinion.

OF THE MORBID CONDITIONS
OF THE
CRYSTALLINE LENS AND ITS CAPSULE.

THE lens itself is subject to morbid changes which affect its transparency, and constitute the disease termed *Lenticular Cataract*; and such changes may be the result of inflammatory action affecting the body itself, or its investing membrane; or be produced by a change or interruption in its vascular supply, the precise nature of which we are unacquainted with; and further, its integrity may be disturbed or destroyed by injury which occasions a breach in its capsule. It also undergoes a morbid change in common with other textures of the eye, in some of the deep seated affections of the organ.

The capsule is liable to similar morbid changes, independent of the surrounding textures, but usually combined with disease of the lens itself:

the anterior portion of the membrane sometimes undergoes a spontaneous change, and becomes opake in part or altogether, independent of disease of the lens; the posterior portion may also be occasionally similarly affected, though I have not seen a satisfactory example of such disease.

The anterior division of the tunic is frequently affected in connection with the iris; for severe inflammatory action rarely occurs in the latter, without, in some degree, influencing the former.

Both the lens and its capsule are occasionally found to be opake at birth; most frequently the former, but occasionally both; this constitutes *Congenital Cataract*.

Further, in very rare instances, both the lens and its capsule undergo a change, by morbid action, which converts them into a firm and brittle substance containing a very large portion of earthy matter, usually denominated an ossific condition. I have seen several examples of such change in the capsule, but only one of the lens.

In all the cases in which I have been able to satisfy myself, by touch with instrument or otherwise, that this ossific state existed, I have found, at the same time, that the patients were completely amaurotic with the eyes so affected; and that, in nearly all, there was evidence of previous deep-seated inflammation.

123. The case, in which I found the ossific Case.

change in the lens, was in a lad about fifteen, who had some years before received a blow upon the eye, which had occasioned deep-seated inflammation, terminating in amaurosis and cataract. At the period at which he came under my observation, dislocation of the cataract had occurred ; it had passed partly through the pupil into the anterior chamber ; and, by its pressure on the iris had occasioned, and still maintained, iritis of a severe kind, with much suffering. I immediately extracted the offending body, and found it to consist of an entire capsule, which was opaque and thick, and containing a mass about equal to one-third of the original lens, hard and brittle, so that it broke on attempting to separate it from the capsule. The patient soon recovered from the effects of the operation, but remained amaurotic.

I have, in two instances, been called upon to operate on cases of cataract combined with amaurosis, in which the general appearance induced me to consider the cataracts of earthy character : they presented a dull yellowish white appearance ; more dense and less uniform than that of the ordinary capsular cataract ; whilst the position of the opacity and the connection of the pupillary margin of the iris to it, by several points of adhesion, proved the disease to be in the capsule. In each case, the disease had been

of long standing ; and the adhesions just mentioned, between the iris and cataract, afforded evidence of previous inflammation ; whilst the total loss of perception of light, indicated deeper seated mischief, and amaurosis. I undertook the operations at the earnest solicitations of the patients, (both ladies,) solely for the purpose of getting rid of the deformity. This I did easily and effectually by the operation of depression, making a clear pupil ; and fortunately, without exciting any important disturbance in either case.

I believe that the change of the lens, or its capsule, into an osseous or earthy substance, is the effect of a slow and long continued inflammatory action ; it is usually combined with other mischief that proves destructive to vision.

Lastly,—the lens is liable to displacement or dislocation from violence.

OF INFLAMMATION OF THE LENS.

THIS I believe to be a very rare disease independent of other ocular affections ; but not uncommon in connection with other deep-seated inflammatory disease, particularly that which attacks the retina and vitreous body ; at the same time, or previous to the development of morbid action in the lens itself, as I have described in the explanation of such diseases.

I have seen a few examples, of what I considered to be inflammation attacking the lens, principally, but attended with marks of disturbance in some other textures of the eye. The symptoms have been as follows :

Symptoms.

A sense of fulness in the organ, with uneasiness about the eyebrow or forehead, and the appearance of dark or grey muscæ, and occasional scintillations or flashing of light ; at the same time, a mistiness of vision which has gradually augmented, without an increase of the other symptoms ; and during the augmentation of the

mist, the vision has been improved by modifying the access of light to the eye, or by dilating the pupil by belladonna.

At first, little or no morbid change could be detected, until the pupil was fully dilated by the influence of belladonna, when a slight central opacity could be discerned in the lens ; and, on watching the progress of the case, the diminution of vision was found to correspond to the increase of this opacity : eventually, it pervaded the whole substance of the lens, giving it a white appearance with a very slight admixture of blue. Appearances.

A little previous to the whole lens becoming opaque, or soon after the cataract has been completely formed, I have remarked, in most of these cases, a decided increase in the bulk of the crystalline body ; and, in a few, to such an extent as to press forward the iris, closing the posterior chamber, and diminishing the anterior ; rendering the iris convex anteriorly, and causing absorption of part of the aqueous fluid.

In most instances, the symptoms of choroid and retinal congestion have ceased, as the cataract has become complete ; but, in a few cases, some muscæ have remained permanent.

The change effected in the lens, and the augmentation or the increase of its bulk, afforded to me satisfactory evidence of inflammatory action

in it ; and the subsidence of the *muscæ*, and scintillations on the completion of the lenticular change, were evidences of the disturbance in the choroid and retina being congestive, and depending upon the continuance of inflammatory action in the lens.

Some of the first cases of this kind, which came under my observation, I considered as disease of the choroid and retina ; and treated them as such, with good effect, as regarded the diminution of the *muscæ* and scintillations ; but not beneficially, as regarded the mist or obscurity of vision ; and I was not aware of the true character of the disease, until the opacity of the lens had become so great, as to be evident in the ordinary condition of the pupil.

The affection, however, in its early stage, differs from the cases of disease of the choroid or retina—in the character of the mist, in the circumstance of the vision being improved, in a moderate light, or when the pupil is dilated by belladonna ; and, further, in the gradual increase of the mist or cloud, without the development of other symptoms, indicating affection of the choroid or retina.

I have only seen this disease in young persons.

The cases are not so favorable for operation as the ordinary cases of cataract, and I should

advise a mild alterative course, of some weeks' continuance, before the commencement of operative measures ; and then, great caution in their adoption.

OF CATARACT.

Definition. **OPACITY**, affecting the crystalline lens or its capsule.

Derivation. Catarrasso,—to break or disturb.

Synonymes. *Hypochyma*, Galen; *glaucoma*, Hippocrates; *suffusio*, Celsus; *gutta opaca*, Arabian; *caligo lentis*, Cullen.

Division. The proper or natural division of this disease is, into *lenticular* and *capsular*; but numerous subdivisions have been adopted, principally, as regards the former; resulting from the appearance or consistence of the lens, when it has become opaque; and further, from the mode of origin of the disease.

Thus, according to its appearance, the cataract is termed milky, purulent, flocculent, radiated, amber, black, &c.; and, according to its consistence, it is described as fluid, soft, or hard; and it is said to be idiopathic or traumatic, as it occurs without any obvious cause, or results from injury.

The opacity of the lens may either be imper-

fect or partial, as not extending through the entire substance ; or it may be perfect or complete, as when it affects the entire lens.

Capsular cataract is simply divided into anterior and posterior ; as the opacity affects either the anterior or posterior portion of the membrane, which invests the lens. But the capsular cataract may also be, as that of the lens, incomplete or partial, or complete and perfect, according to the extent of the morbid change.

The only useful divisions, however, are such as tend to practical good ; and in this respect, as regards lenticular cataract, it is only necessary to make two—soft, and hard. This division I shall adopt ; but, in my description of these, I shall endeavour to point out the principal varieties of the disease, and explain the modifications of treatment required in each.

As regards capsular cataract, there is little utility in any division, further than as regards the origin or cause of the disease, which materially influences the prognosis, and requires a modification in treatment, by operation.

The congenital disease will be treated of separately.

OF LENTICULAR CATARACT.

Symptoms.

The disease, commencing in a lens previously perfect, causes a mistiness of vision ; the patient complains that all objects appear as if seen through a slight fog or cloud ; and this is more especially the case when the light is brilliant, or in large quantity ; and at first the mist disappears when the light is moderate, or modified by shading the eye, or by the intervention of a colored glass. Thus, a person afflicted with this disease, suffers from confusion of vision when exposed to the mid-day light ; but sees distinctly towards twilight, or when the quantity and intensity of the light is much lessened : he would also have distinct vision, in a room in which the entry of the light would be partly intercepted by a thin blind or curtain ; whilst confusion would arise, if he were to expose himself to the light out of doors ; or to that of a room where the light would be admitted in large quantity, without any modification.

All this arises in consequence of the opacity of the lens commencing in the centre, and clouding the axis of vision, so that when the pupil is contracted under the influence of much,

or a strong light, the rays only pass to the retina through the diseased portion of the structure, and all objects are indistinct; but as soon as the pupil expands, when the light is diminished, or modified, the circumference of the lens which retains its proper transparency transmits the rays perfect and distinct to the retina, and objects become clear.

When the disease is of slow progress, the patient usually discovers that the vision can be improved by modifying the light; and soon acquires a habit of shading the eye with the hand, when desiring to view small objects. These circumstances also readily explain why the vision is so much improved by the influence of belladonna, which creates a dilatation of the pupil.

The slight degree of mist, which I have mentioned, increases with more or less rapidity in different cases; usually, the augmentation is very gradual; and many weeks or months elapse before the patient loses the perception of small objects, when the light is modified, as I have described. Eventually, however, the mist extends, and causes a confusion of vision under all circumstances; but it is much greater when the pupil is contracted, than when it is dilated by modifying the access of light, or by the use of belladonna; for when the patient is unable

to discern large objects whilst the pupil is in the former condition, objects of moderate size may be distinguished, when the pupil is in the latter state: but, eventually, a general thick mist pervades the whole field of vision, whatever may be the state of the pupil.

During the progress of the disease, the patient, for a time, can generally distinguish objects best, which are not opposed immediately to the axis of vision; thus, whilst recumbent, the patient may be able to see the objects in his room, placed beyond the foot of the bed, which would become indistinct when he assumes the erect posture; because, while recumbent, the rays are transmitted from the objects through part of the still transparent circumference of the lens, or pass between the opake nucleus and the pupillary margin of the iris to the retina; but, as soon as he rises, the direct passage of the rays is intercepted by the opake nucleus. For the same reason, the patient for a time holds small objects rather below, or to, the temporal side of the eye, as he thereby obtains a more distinct view of them.

Such is the progress of lenticular cataract in a very large majority of cases; but now and then, during the progress of the disease, objects appear distorted; and those of brilliant character are sometimes multiplied: thus, the outline of a

figure may present unnatural irregularities ; straight lines may appear bent or curved ; and candles, lamps, the moon, or other luminous bodies, may seem increased in number, in a moderate, or excessive degree ; as, the moon may appear double, or treble, or even multiplied to many scores. When these modifications of symptoms have presented themselves, I have found that the opacity of the lens has not been confined merely to the centre ; but that one, or two, or several opaque radii have existed, passing from the centre to the circumference of the body ; these would, in my opinion, readily account for the additional symptoms just enumerated ; for each opaque radius would offer a reflecting surface, which would materially affect the passage of some of the rays of light, to the retina ; and cause an irregularity in outline, or distortion of straight lines, in objects not luminous ; and, further act, as the surfaces in the kaleidoscope, in multiplying those especially of luminous character.

The disease of the lens does not, of itself, give rise to any appearance of spots or muscæ, or sparks, or flashes ; though such symptoms occasionally exist during the formation of cataract ; they result from an affection of choroid or retina, and should be carefully noted ; as they require distinct treatment, and render the prog-

nosis of the case, as regards the success of operation, more uncertain than when the cataract forms, independent of them. As a proof that the *muscæ*, &c., are not caused by the lenticular disease, I would observe, that I have many times removed cataracts from patients who have complained of *muscæ* ; and, I have invariably found that the *muscæ* continued, after the cataract had been got rid of.

As the disease usually commences in one eye first, and sometimes becomes complete in the one before it begins in the other, it is common for patients to lose the correct judgment of distance ; so that they commit frequent blunders in attempting to seize small objects ; or in progression, making false steps ; much as a person will do, who, possessing perfect vision with both eyes, attempts to perform any act requiring a correct knowledge of distance, whilst one eye is obscured : for example, if a person possessing good vision cover one eye, and then attempt to snuff a candle, he will not be able to accomplish it well, until after many trials ; being accustomed to judge of distance with the aid of both eyes ; or rather, having acquired the knowledge of distance by the combined power of the two organs, the deprivation of one, immediately destroys the accuracy of the acquirement.

Variety in
symptom.

In some cases, the formation of cataract pre-

sents a marked difference in one symptom, which is usually considered as the best indication of the commencement of this disease, namely, the improvement of vision from dilatation of the pupil; for occasionally the reverse happens, and the patient sees best in a bright light; and the sight becomes more confused, when the pupil is dilated by belladonna. This variety in symptom arises from the mode in which the disease begins, which is at the circumference of the lens, instead of in the centre; so that when the central part becomes affected the circumference is nearly opake; and, consequently, its exposure by dilatation of the pupil, cannot give any increased power of vision; but, in fact, further confuses the sight, by causing much error in the refraction of the rays of light which are transmitted to the retina.

When the opacity commences at the circumference of the lens, it nearly always extends to the centre by radii, independent of a general haze; the opake radii being more dense, and extending further than the general opacity, until the whole structure is affected; when the radii are continued from the circumference to the centre, but are still distinguishable, from being more opake than the general substance of the lens.

Whenever these opake radii exist, whether

commencing from the centre or the circumference, the cataract has usually a peculiar glistening appearance, like that of mother-of-pearl : this appearance has been supposed by many, and is described in most works upon the subject, as indicative of opacity of the capsule : but I have had such frequent opportunity of proving it to be in the lens, that I have no hesitation in declaring that it is not an indication of capsular opacity. I have frequently pointed out such appearance to my pupils, and others, present at my operations, before preceding to extract the lens ; and after its extraction, have exhibited the lens deprived of its capsule, but still presenting the radiated appearance ; whilst the eye, from which the lens has been removed, has presented a clear dark pupil, although the capsule of the lens remained. Now and then the morbid change commences nearly simultaneously in the centre and at the circumference, in which case vision is disturbed at an early period, and is not improved by a dilatation of the pupil.

Progress.

The progress of this disease is usually slow, and many months elapse from the first disturbance of vision, until it is destroyed for all useful purposes. Sometimes it becomes complete in a few weeks, and this is most frequent in persons under the middle period of life : and I have known it, in one instance, advance so rapidly,

that the patient, who could, on one morning, read a moderate sized print, with tolerable ease; on the following morning could only distinguish light from darkness; the lens having become perfectly opaque in the interim.

124. This occurred in a gentleman of highly Case. nervous temperament, who had been greatly alarmed on the evening preceding the loss of vision; and, probably, the influence of the mental disturbance on the general circulation hastened the termination of the local disease.

In persons naturally of a quiet disposition, and possessing a tranquil and slow circulation, the progress of the affection is usually slow: it also proceeds tardily in those who do not possess much natural power; or in whom the power is diminished by other disease, or by medical discipline. I have known a few instances in which three or four years have elapsed, from the period at which the commencement of the disease could be distinguished, before it has increased to such an extent as to deprive the patient of the power of following his ordinary avocations. These extreme cases of rapid, or slow formation of cataract, are, however, rare.

The patient, suffering from cataract, seldom derives any benefit from convex or concave glasses; but in the early stage of the disease, some advantage is obtained from the use of a

plane glass tinged with some dark color, or black, which modifies the light, and promotes expansion of the pupil.

Appearances.

The most common form of cataract, in the elderly person, begins by a slight grey or whitish change in the centre of the lens. This spot is most dense in the middle, whilst its circumference is imperceptibly blended with the surrounding transparent structure. The opacity is frequently imperceptible when the eye is examined under a direct and strong light, which causes the pupil to contract; but it is easily to be distinguished, when the pupil has been dilated by the influence of belladonna; and the aid of this agent should be obtained, in all cases, in which any doubt exists, respecting the nature of the disease, whether it be cataractous or amaurotic. The advantage of employing this agent is well illustrated by the following circumstance.

Case.

125. A gentleman lost his vision in a great degree, during a voyage across the Atlantic, in the early part of which he had amused himself, for many hours together, by watching the fish which played about the bows of the vessel; and he had thus been exposed very much to a strong and brilliant light. On his arrival in England he consulted a gentleman of great experience in ophthalmic diseases, who decided that the case

was of amaurotic character ; and, therefore, recommended mercurial treatment : the patient, however, thought it prudent to take a second opinion, before he decided on submitting to the remedy proposed ; and he accordingly sought the advice of another professional man, also of much experience, who immediately applied some belladonna to the eyebrows, and seated his patient in his waiting room, desiring him to keep his eyes closed, and his back to the light, that the belladonna might act rapidly. After the lapse of a quarter of an hour, or rather more, the patient forgot the injunction to keep his eyes closed ; and, having opened them, was astonished to find that he could distinctly perceive all the objects in the room ; and, after a short time, upon opening a book, he found he could read with facility ; the pupils being dilated, a central opacity in each lens became evident, and the cause of his previous blindness was thus readily explained. In this state, the patient again visited the gentleman whom he had at first consulted, and whom he soon satisfied of the incorrectness of his diagnosis.

Usually, however, when the opacity is of sufficient extent to give a general mistiness to the field of vision, it can be detected by examination of the eye whilst the pupil is in the natural state ; because this space has a greyish aspect instead of a brilliant black appearance.

As the vision becomes further impaired, this grey appearance of the pupil augments, and, frequently, changes to an amber color; and if the eye be now examined with the pupil dilated, the opacity will be found to occupy the larger part, or entire, of the lens; and the amber tinge will be more marked in the centre, but gradually blended towards the circumference, with a grey or whitish matter of less density. (*See plate 4, fig. 3.*) The amber tinge varies very much in different cases, being in some very slight, and in others so great as to approach a deep yellowish brown color. When the color is very dark, the disease is not easily distinguished whilst the pupil is in the natural state, unless by careful and close inspection: the extreme cases of this kind, are, I presume, those which have been denominated *black cataracts*. The extent and depth of the amber tinge indicates the consistence of the cataract: the amber color always denotes a hard condition of cataract; and the extent of hardness, of the diseased body, is always in proportion to the extent and depth of this tinge. If any grey or whitish matter exist towards the circumference of the amber color, it indicates a soft condition of the circumference of the cataract; and, in most cases, some portion of such matter is found.

Next in frequency, in persons above the middle period of life, we find the opaque radii,

which I have before described, in addition to the general opacity just noted ; and, occasionally, the variety, which I have also mentioned, in which the disease commences at the circumference of the lens. But even in the latter case, the amber tint becomes developed, as the central part of the lens becomes affected.

In rare instances, when the cataract commences from the circumference, and proceeds by radii towards the centre, these radii are at first confined to the posterior hemisphere of the lens ; and have been described as indicating opacity of the posterior portion of the capsule of the lens. This opinion, however, is equally erroneous, with that before adverted to, respecting the anterior portion of the lens ; as I have had opportunity of ascertaining, by watching the progress of such cases, and subsequently extracting the cataracts.

In young persons, and in most patients under Soft. the age of forty, the disease commences by a central light grey opacity, which by degrees extends, and affects the whole lens ; and as it augments, the central part becomes more dense, whilst the circumference remains grey, and is blended, very gradually, with the surrounding transparent structure, until the whole becomes opaque. When complete, the cataract has most frequently a whitish glistening appearance, with

a slightish tinge of blue, closely resembling the appearance of London milk. Sometimes the surface of the opake body appears flocculent, like the surface of a recently broken piece of spermaceti; (*see plate 4, fig. 2;*) at other times, radii, somewhat similar to those which I have described as occurring in the formation of hard cataract, are apparent; but they are less distinct, being very little more dense than the general mass; yet they are usually more brilliant or glistening, than those connected with the cataract of elderly persons. *See plate 4, fig. 4.*

Fluid.

Lastly, the aspect of the cataract is occasionally like that of cream, being white with a very slight tinge of yellow, somewhat like the appearance of pus, from which circumstance the cataract has been named *purulent*. This appearance is uniform, being equally dense at the circumference as at the centre, and there is no glistening at the surface: now and then the yellow tinge is wanting, and the aspect of the cataract is perfectly white; (*see plate 4, fig. 1;*) either of these conditions indicates a fluid state of the cataract; and the uniform density, and want of glistening appearance, distinguish this form of the disease from either the hard or soft. It is most frequently met with in the young subject, when the whole cataract is usually fluid; and this may be in great measure determined

before operation be resorted to, by examining the eye when the pupil is fully dilated ; for if in this state the organ be carefully examined, by inspecting it obliquely, or laterally, whilst the patient is seated erect, opposite a good light, the opaque body will then be found to project most at the lower part, instead of at the centre, indicating that the capsule is distorted, by the gravitation of the fluid. But this form of cataract is also occasionally found in elderly persons, when, however, the cataract is rarely fluid throughout ; but the circumference alone is liquid, and the centre firm or hard. In these cases, when the eye is examined, the pupil being dilated, there is no perceptible bulging of the lower part of the capsule ; yet there is nothing in the appearance, otherwise, to indicate that there is any inequality in the consistence of the disease.

I believe that the cataract is rarely, if ever, formed in a fluid state ; but that the change is effected in its consistence subsequent to the loss of transparency, in the original structure. All the cases that I have met with have been of long standing, and I have never been able to detect any thing like this fluid change, during the progress of the disease.

When opacity of the lens has once commenced, Treatment.
I do not believe that there is any plan of treatment, local or general, which will subdue the

disease, or prevent it from eventually affecting the entire lens : very numerous remedies have been from time to time proposed, and many have been believed, for a time, to have had the desired effect ; but the best proof of their inefficacy is, that they have, one after the other, fallen into disrepute. There is no doubt, that, in some cases, the disease may be retarded by local bleeding, and the use of counter-irritation : most of the remedies which have been held in any degree of repute have been of the latter class, and have been employed on the conjunctival surface, in the shape of drop, or ointment ; the effect of which has been to occasion profuse lachrymal secretion. They have been for the greater part empirical, or secret remedies ; but such as we have been able to ascertain the qualities of, have proved to possess merely simple irritating or stimulating properties. If I had purchased all that have been offered to me, as specifics for this disease, I should have needed the purse of Fortunatus, to have satisfied the demands of the venders.

I think it probable, also, that the advance of the disease might be retarded, in some cases, by such a plan of dietetic and medicinal treatment, as would keep the circulation rather below the natural standard : but I am satisfied that the disease will advance in a very large majority of

cases, in spite of all remedies, except that of operation.

During the progress of the disease, however, the use of the belladonna materially assists the patient, with very few exceptions ; and a drop or two of a carefully filtered solution of the extract, in the proportion of one scruple to the ounce of distilled water, should be dropped into the eye, upon the conjunctiva, night and morning, so long as the patient obtains advantage from it ; at the same time, the patient should be directed to adopt such dietetic and other means, as may tend to promote the condition of health, most favorable for an operation.

OF CAPSULAR CATARACT.

OPACITY may occur either in the anterior or posterior portion of the membrane which invests the crystalline lens : such affection of the anterior portion is very common, as a consequence of inflammation of the iris particularly ; now and then it occurs independent of such disease. Opacity of the posterior portion, rarely, if ever, takes place independent of disease of the lens ; for this part of the membrane being the principal source from which the organization

of the lens is continued, it is scarcely to be expected that it should undergo any extensive morbid change, without the lens itself becoming affected.

I am not aware that any practical good would result from the most accurate diagnosis as regards the seat of the opacity, whether it be in the anterior or posterior portion of the capsule, supposing it to exist independent of any other disease; for if the surgeon cannot succeed in relieving the complaint by medical treatment, he cannot succeed in getting rid of it by operative means, without, at the same time, getting rid of the lens; for it is impossible to remove either the anterior or posterior covering of the crystalline body without inflicting such injury, or so exposing it as to produce a cataractous condition of it, supposing it to be previously perfect.

OF ANTERIOR CAPSULAR CATARACT.

THIS may be partial or complete, and may occur independent of other disease, or be produced by extension of inflammation from the surrounding textures, more particularly the iris.

Symptoms. Interruption to vision, according to the extent of the morbid change.

When the affection occurs without disease of Appearances.
 any other tissue, it has a dense white aspect, as that of unglazed paper, or of the surface of an egg-shell of the common fowl; it is to be distinguished from opacity of the lens by its greater density, by its want of all glistening appearance, (for it in great measure loses the property of reflecting the light,) and by its position, as it appears almost in contact with the pupillary margin of the iris; whereas, the lenticular opacity always seems to be distinctly separated from the iris. If the pupil be dilated, and the whole capsule be affected, it has a uniform character, without flocculi or radii, such as I have described occasionally existing in the lenticular disease. (*See plate 4, fig. 5.*) If it be partial, the opaque portion has a uniform appearance, and generally terminates by an abrupt and defined edge, instead of being gradually blended with the transparent part, as we find in the common partial lenticular cataract. *See plate 4, fig. 6.*

I do not recollect to have seen even partial disease of this kind, independent of disease of the lens, excepting congenital; though I think it possible that it might occur.

The disease in the anterior capsule, when produced by extension of inflammation from the iris, or surrounding textures, has been already described.

OF OPACITY OF THE POSTERIOR CAPSULE.

I HAVE never seen a case in which I was satisfied that this portion of the membrane was alone the seat of opacity ; and I have stated why I consider it improbable that it should be so : supposing it to occur, I believe that it would present very similar characters to those which indicate such change in the anterior part of the membrane, excepting that which would necessarily result from position ; and that instead of appearing in contact with the iris, it would be distant from it, and present a concave surface.

OPACITY OF THE ENTIRE CAPSULE.

THIS state must necessarily be difficult to determine by external examination, as the appearances presented would be only those indicating the disease of the anterior part ; when, however,

we find that the bulk of the crystalline body is sensibly diminished, (and this may occasionally be distinctly detected by careful examination of the eye with a fully dilated pupil,) I believe that we may correctly determine that the entire capsule is diseased. This has been the result of my experience, and I do not consider it likely that the bulk of the lens would diminish to such an extent as to be detected by superficial examination, whilst the posterior part of the membrane retains its integrity.

When the opacity of the capsule occurs, independent of disease in the surrounding textures, I know of no means, short of operation, which can remove the impediment to vision. When arising in consequence of extension of inflammation from surrounding parts, I have previously described the treatment which should be adopted.

OF CONGENITAL CATARACT.

CATARACTA congenita.

Synonyme.

The parent or nurse of the child observes that the infant does not take notice of, or has not his attention attracted by, surrounding objects ; and, perhaps, in addition, that it rolls the eyeballs

Symptoms.

about in a very unusual manner; and, in some instances, it is discovered that the pupil of the eye is grey or white, instead of black.

Appearances. The extent and character of the disease, and the condition of the other textures of the globe, can only be determined by accurate examination at a very early period of life; and the examination is materially aided, by producing a full dilatation of the pupil with belladonna.

Division. The disease may be found to affect a part of the lens, or the whole, or its capsule, or both; it may be therefore either partial or complete, lenticular or capsular, or capsulo-lenticular.

The appearances which I have already described, when treating of cataract generally, may be equally relied upon in forming a diagnosis in congenital cases. When the cataract is lenticular, it has a whitish, grey, or slightly flocculent aspect, with a glistening surface. When it is capsular, it is nearly always white, and does not glisten. I have, in a few instances, found the congenital cataract to be fluid. It has then presented a uniform white surface, not so glistening as the soft lenticular cataract, or so dull or dense as the capsular opacity.

Very frequently we find the disease to be partial, when the opacity is generally central, and terminates abruptly, having a defined margin, and not blended with the surrounding transpa-

rent structure, as I have described the central opacity, or commencement of cataract, to be in the adult.

The extent of these partial cataracts varies exceedingly. When lenticular, they occupy from a minute spot, to three-fourths of the entire structure. The opacity is usually grey or flocculent, and from its situation may easily escape detection, unless the pupil be dilated by belladonna.

In most instances, the circumference of the opacity is decided and even; but, occasionally, small opaque striæ or radii pass from the central opacity to the margin of the lens. If the opacity be capsular only, it is also generally central, and varies in size, from that of a minute point, to one-fourth or one-third of the extent of the capsule, or of the anterior portion in which the opacity is seated.

When the disease affects both the lens and capsule, the latter is usually completely opaque, so as to prevent a view of the former; but now and then we find the lens perfectly opaque, and the capsule only partially so; having, perhaps, one central spot, or otherwise several small well defined white marks with intervening clear spaces, through which the opaque lens can be distinguished.

When the cataract is complete, as affecting Treatment, either the lens, or capsule, or both, the only

mode of relief is by operation ; and the most important question is then, to determine at what period the operation should be performed.

From the experience which I have had, and which has been very great, I should recommend that the operation be performed not later than the third month, provided that the health of the child be good. I have operated in the fourth week after birth, and with perfect success ; and my reason for adopting and recommending early operation is, that it prevents the infant from acquiring a rolling motion of the globe, which sometimes commences a few weeks after its birth ; and which, when once acquired, rarely afterwards subsides ; so that when the cataracts are removed, this constant motion of the globes prevents steady vision.

Perhaps these cases might be safely left, without risk or impropriety, until irregular motion of the globe be perceived ; but the safety and efficacy of Mr. Saunders's plan of operation are now so fully and satisfactorily established, that I see no good reason for waiting for the occurrence of the involuntary action ; and should consider the surgeon to be highly culpable, who permitted a delay in the operation, when the child begins to roll the eyeballs in an unusual manner.

The anterior operation for solution is the best and safest, in congenital cases ; but sometimes,

when the capsule is opaque, the use of the needle posterior to the iris is required, to complete the cure. With moderate caution, these operations are almost infallible.

Partial opacity of the lens or capsule, which does not extend to the entire diameter of the pupil, produces little or no inconvenience or interruption to vision; and a patient, so circumstanced, might pass through life without being aware that any defect existed; but when the cataract occupies a larger space in the lens or capsule, than that of the ordinary size of the pupil, the vision becomes imperfect as soon as the organs are exposed to much light; but objects can be perceived, distinctly, when the light is moderate, though the patient usually regards them obliquely, being unable to distinguish what is placed opposite the axis of the eye.

When the opacity occupies more than half the lens or capsule, or an extent larger than that of the pupil in its greatest state of natural dilatation, the patient is unable to do more than distinguish large objects in a moderate degree of light, and that only by viewing them obliquely; so that he soon acquires an awkward motion of the head; moving it frequently from side to side, to obtain a view of objects about him, through the limited space which exists for visual purposes, between the

cataract and the iris. The extent of vision is much greater when the disease is lenticular than when it is capsular; and, in both cases, the patient has no useful vision when exposed to a bright light.

In some of these cases, when the pupil is naturally small, and the disease entirely lenticular, it is very difficult to be distinguished by an ordinary mode of examination; and I have known several instances in which the disease has been mistaken for imperfect amaurosis. Some of these cases have presented considerable interest.

Case.

126. A lady, aged twenty-nine, came to me from Norfolk, in consequence of my having relieved a relative from defective vision, she herself having always had very imperfect sight; she could only with difficulty guide herself out of doors in broad day light, unless the light were modified by a projecting bonnet and veil; she had little or no perception of minute objects, and could only distinguish those of small size when very near to her, and when placed in a particular position. She had by great perseverance taught herself to read with letters of above an inch in length, and accomplished her reading only letter by letter. When she entered my room I was struck by the peculiarity of her movements; the head was inclined forwards, and she constantly turned the

face from side to side, advancing very cautiously, much as a person would do who was in search of some small object on the ground: though, by watching her, it was evident that the eyes were not directed to the ground. When I learned, further, that she had no useful vision when exposed to a bright light, and could only see small objects in a moderate degree of light, at the same time shading the eye with her hand, I became satisfied that she must be the subject of partial cataract. I immediately applied a solution of belladonna to each eye, and placed her with her back to the light, desiring her to keep her eyelids closed. After occupying about a quarter of an hour in ascertaining the previous history of the case, and its treatment, from which I could elicit nothing satisfactory, I proceeded to examine my patient. Having turned her towards the light, I directed her to open her eyes; and I shall never forget her exclamations of surprise and delight, on finding herself able to see all things distinctly. For some minutes she was in incessant movement about the room, anxious to touch every thing to satisfy herself that she was not deceived, uttering, at the same time, constant expressions of gratitude and delight. When she had become a little calm, and convinced of the reality of her condition, a fresh cause of excitement presented itself; namely, a

dingy London sparrow which perched itself on the railing opposite the window, affording charms appreciable only by herself, in being the first of the feathered tribe she had ever seen.

The cause of the previous defect of vision was now apparent. Each lens presented a central opacity of a lightish grey tint, which occupied about two-thirds of the extent of the body; the surrounding part being perfectly clear and transparent. I merely prescribed a solution of belladonna for her, to be applied night and morning, directing her to obtain a fresh supply every three weeks. By the use of this remedy she has since enjoyed excellent vision, being able to see minute objects readily. Many years have elapsed without producing any change in the power of her sight, and without the influence of the belladonna being lost; or any ill effect being produced in the patient by the continuance of the remedy.

Case.

127. A boy, nine years of age, was brought to me by his parents, in consequence of great defect in his vision. Being natives of New York, they had repeatedly sought advice in the principal cities of the United States for the child, who was their only one. Subsequently, they had been to France, Germany, and Italy, solely with the view of obtaining relief for their son. Every where, and from every body they consulted,

they obtained nearly the same opinion, namely, that the defect was in the nerve, or the retina. Still, however, in hopes of obtaining some degree of benefit, they came to London, and, after seeing two professional gentlemen, who gave them no hopes of relief, they came to me. As they entered my room, I observed the same peculiar cautiousness of gait, and motion of the head, which I have described in the foregoing case, which induced me to address the father with the query of "How long has your boy had cataracts?" To which he replied, that he had not cataracts, but defect of power in the nerves of the eyes. On examining the eyes attentively, I could detect a very light grey appearance in each pupil, at a short distance from the iris. I then applied some belladonna, and placed the patient so as to favor its operation, and then obtained a more perfect history of the case.

After about twenty or twenty-five minutes, I again proceeded to examine the boy, and, the pupils being fully dilated, the cataracts were distinctly seen, occupying nearly three-fourths of each lens; the opacity of each, presenting a defined, but rather irregular edge, with several opake striæ, radiating from the opacity to the margin of the lens. The vision of the boy was greatly improved; he could guide himself with facility, and could distinguish readily the larger

objects in the room ; but small objects, he appeared still to have difficulty in distinguishing correctly. I advised that he should use the belladonna, night and morning, for one week, to enable me to judge if improvement of the vision took place. At the expiration of the week, very little beneficial change from that which occurred on the first operation of the belladonna had taken place ; but it was determined that a further trial should be made, before any other proceedings were decided upon. Such trial having failed to effect any marked relief, I recommended operation, which the parents readily consented to ; and which perfectly succeeded in bestowing good sight, with the aid of artificial lenses, for minute purposes. After a few weeks, they returned to America, highly gratified with their visit to London ; and rewarded for their anxiety and perseverance in seeking relief for their child.

Use of bella-
donna.

The former of the cases, above related, points out the best plan of treatment ; namely, the constant use of belladonna, so long as it affords the patient good vision. In the case referred to, it has been used above ten years ; and a gentleman, a barrister, told me that he had employed it, under similar circumstances, for above eighteen years, frequently applying it four or five times in the day. After this long continued

use of the narcotic, I had an opportunity of examining the eye, he having omitted the application, at my request, for forty-eight hours. I then found the pupil of natural size, and the motions of the iris as rapid and perfect, as if the belladonna had never been employed. I know many other instances in which belladonna has been constantly used, for several years together, without any injurious effect, and without losing its influence upon the iris. It should, therefore, in my opinion, be employed in all cases similar to the one just referred to.

Another very strong reason for such practice is, that these cases are unfavorable for operation. We have found at the London Ophthalmic Hospital, that inflammation has been much more frequent after operation in these cases, than in the ordinary forms of cataract. When, however, the disease is so extensive that the patient is incapable of distinguishing small objects with accuracy, so as to be unable to read, operation may with propriety be resorted to;—but only one eye should be done, at a time; and that with great caution and delicacy. It is right to observe, that most of the instances, in which operation has been productive of injurious effects, have occurred in patients above the age of puberty; whereas, in children, little mischief has resulted, under my own observation.

OF THE TREATMENT OF CATARACT BY OPERATION.

THREE different modes of operating for the removal of cataract are at present in use ; one, by which the opake body is entirely removed from the eye, or taken out—this mode of operation is termed *Extraction*.

A second plan consists in displacing the cataract so as to remove it from the axis of vision, and still to allow it to remain in the eye in the lower part of the vitreous body—this is termed the operation of *Depression*.

The third mode of operating is to open the capsule of the lens, so that the cataract be submitted to the influence of the aqueous humor, by which it becomes dissolved—this is called the operation for *Solution*.

In some instances it is useful to modify or combine these operations ; and, besides the explanation of the three operations I have mentioned, I shall describe two others ;—one, of *Drill-*

ing the cataract ; and another, in which the operations of solution and extraction, or of solution and depression, may be advantageously combined, in treating the same case.

OF THE OPERATION FOR THE EXTRACTION OF THE CATARACT.

THIS operation is more particularly adapted to cases of hard cataract ; but there are circumstances which, in some cases, render it so extremely difficult and hazardous, that it should not, in my opinion, be attempted.

I consider that it will be better to notice such circumstances, before describing the operation : they may be divided into local and general.

It is scarcely necessary, perhaps, to observe, Local circumstances. that the existence of any other important disease Other disease. of the globe, or its appendages, forbids the operation.

There is one affection which I have occasionally found, in making careful examination of the organ, which had escaped my notice upon a superficial view, but which would have offered serious impediment to the extraction of the cataract, had it been attempted ; or would have defeated it altogether. Adhesions form between

Iris adherent
to capsule of
the lens.

the iris and anterior capsule of the lens, which are not visible in the ordinary condition of the pupil ; but which immediately become apparent, when it is dilated by the influence of belladonna. If such adhesions exist in more than one or two points, the pupil cannot dilate sufficiently to allow of the escape of the cataract ; consequently, if the operation were to be commenced, in such a case, instead of the lens escaping from the pressure employed to force it through the pupil, the hyaloid membrane would rupture, and the vitreous humor would flow out ; but the cataract would not escape, unless the adhesions were destroyed by force, as with the point of the curette, or the iris partly divided by a knife or scissors, so as to enlarge the pupil. This shews the necessity for an examination of the eye, with the aid of the belladonna, before deciding upon the form of operation.

Anterior
chamber small,
and cataract
very large.

It will also be found, that although the cataract be hard, the bulk of the lens is sometimes augmented, and presses forwards the iris, so as to diminish materially the size of the anterior chamber. This will be perceived immediately on viewing the eye in profile ; and if the space be not sufficient for the passage of the knife, to make the section of the cornea, I should strongly recommend a modification of the usual operation, which I shall hereafter describe.

From natural formation, the size of the ante-
rior chamber may be so small, as to render the
same proceeding desirable.

Anterior
chamber natu-
rally small.

Further, although the globe present every ap-
pearance of health, independent of the cataract,
yet to the contact of the fingers it may feel soft
or flaccid : this indicates an altered condition of
the vitreous fluid ; and if extraction be per-
formed, the eye would probably be lost ; as this
fluid would immediately or gradually escape,
through the section of the cornea.

Globe soft.

If the formation of the cataract have been at-
tended with pain, or with the appearance of
sparks or spectra, or if the lens exhibit the
slightest shade of green, the prognosis is gene-
rally unfavorable, as regards operation ; although
there be not any other evidence of disease.

Cataract of
green color.

Two other circumstances, depending upon
natural formation, will impede, or prevent, the
performance of this operation ; first, the globe
is sometimes so deeply seated in the orbit, that
the surgeon cannot make the section of the
cornea, in a manner likely to give a successful
result to the operation. Secondly, the pal-
pebral aperture is occasionally so small, that the
globe cannot be sufficiently exposed, for the same
purpose. In either case, it is best not to attempt
the operation.

Situation of
the globe.

Size of palpe-
bral aperture.

Even when all local circumstances are favor-

General
circumstances.

able to the operation, the surgeon will have very indifferent success resulting from his performance, unless he carefully direct his attention to those of a general character.

The operation itself is attended with so little suffering, and inflicts so little injury, that those not much conversant with ophthalmic surgery scarcely deem it necessary to make any general enquiries; having satisfied themselves that no local error exists. This makes me the more anxious to shew, that there are many general considerations which must affect the result of the operation.

Circulation
too powerful.

In the first place, if the patient be in robust health, the circulation vigorous, and a little above par, acute inflammation may be excited by the operation, and this may destroy the eye in the course of a few hours; in such persons, therefore, it is necessary to lower action by abstermious living, by purgatives, or by abstraction of blood. I much prefer reducing power by lessening the patient's diet, for a few days, previous to the operation; and by acting on the bowels freely, the day before its performance, rather than by taking away blood; although, in a few instances, I have found the latter proceeding to be necessary.

It may be said, that it is time to employ such remedies, when symptoms of inflammation ex-

hibit themselves ; but very little experience would convince any one of the folly of such advice : for if inflammation once commence, it is not always under our control ; and, in this case, the means, necessary to subdue it will occasionally disturb the process of union of the cornea ; and suppuration of this part would probably ensue. It is better, at all times, to prevent disease, than to have to combat it.

When I became surgeon to the London Ophthalmic Hospital, the usual practice was to take some blood from the patients submitted to the operation of extraction, in the evening after the operation ; the first patient, a female, from whom I extracted a cataract, was bled in the evening, according to the ordinary practice ; after the loss of a few ounces of blood, the patient became faint, felt sick, after a few minutes vomited violently ; and during the act of vomiting, the vitreous humor was ejected through the section in the cornea, in so large a quantity, as to destroy the eye : my operation having been performed as I wished, I was much annoyed by this untoward result, yet it gave me a useful lesson ; I did not again allow a patient to be treated on the same plan, but I have ever since been very careful to have my patients in favorable condition, before I have undertaken to operate.

There is not likely to be so much error in this general point, as in the next which I have to mention; as very few surgeons of the present day proceed to operate, without some previous attention to the patient's diet, and to the state of the secretions.

Circulation
too feeble.

The next point is one of great importance, more particularly, because it has been but little noticed. The hard cataract, as I have before observed, occurs most frequently at an advanced period of life; and is common in persons in whom the general powers are failing. It is not uncommon to find the patient so feeble, that there is not sufficient power to repair the mischief, inflicted by the operation. In very feeble persons I have seen the section of the cornea, eight and forty hours after the operation, as free as if just made, without the slightest disposition to adhesion; but soon after, inflammation with suppuration has come on; and the eye has been destroyed. It is, then, as necessary to ascertain that the general power is sufficient, as it is to learn that it is not in excess.

How obviated.

In many instances, especially among the poorer class, we can raise power to a sufficient extent, by improving diet, and by the use of medicinal, or other stimuli. Where this cannot be accomplished, this operation ought not to be performed.

These are the two principal general points ; but there are some others, perhaps, deserving of notice ; as the impropriety of operating during the existence of mental anxiety, or where there is evidence of any general affection existing, which predisposes to inflammation of the eye, such as rheumatism or gout. Evidence of rheumatism or gout.

There are a few other circumstances which must not be overlooked, as I have known them to have a material influence on the success of the operation.

Difficulty in respiration from cardiac or pulmonary disease, particularly if accompanied with cough, is likely to call forth some sudden effort on the part of the patient, which may disturb the union of the cornea, and protrude the iris ; or even cause the escape of vitreous fluid. Where there is confirmed asthma—where there is angina—or when a patient suffers from habitual hard cough—the operation can hardly be performed with a tolerable prospect of success. Difficult respiration.

CONSIDERATIONS PREVIOUS TO THE OPERATION.

THE operation being determined upon, the surgeon should be prepared, in every respect, when he attends to perform it. He should, therefore,

previously have seen that he can procure sufficient light, and the conveniences of a couch or chair, suitable for the patient during the operation. He should direct that some soft linen and a broad ribbon be provided, and a small quantity of tepid water. He should examine the bed, in which the patient is to be placed after the operation, which should be provided with additional pillows and a footboard; so that the patient may have the head and shoulders raised, and be prevented from sinking from the pillows during sleep. I usually direct that the corners of the pillows be tacked with strong thread to the bolster, so as to prevent them turning up against the eye.

In the next place, the surgeon should select an assistant to whom he should give full directions, as to the duties he will have to perform. The duty of the assistant is, in many instances, of the utmost importance to the operator; especially, when he has to elevate and fix the superior eyelid; whilst the section of the cornea is being made. When I used to trust this to the assistant, I had ample experience of the necessity of his being perfectly conversant with his duty; for, in several instances, the lid has escaped from the finger of the assistant, whilst I have been passing the knife through the anterior chamber.

The surgeon should be provided with the following instruments, and be satisfied that they are in good order :

Two knives for making the section of the cornea.

A curved knife for enlarging the section, if required. This may be made to cut either on the concave or convex edge, at the pleasure of the operator.

A curette, for lacerating the capsule, and for taking away any fragments of the cataract which may remain, after the removal of the greater mass.

A fine hook, to seize the cataract, should it become displaced, with rupture of the hyaloid membrane ; so that the vitreous humor escapes under the ordinary pressure employed to remove the lens.

A fine pair of scissors with probed extremities, to divide the iris when the pupil is too small to admit the cataract to pass through it ; or when, by accident, an opening is made in the iris by the knife, in performing the section of the cornea.

The instruments I employ are delineated in plate 9.

I prefer the knife represented *fig. 1, plate 9*. It is a modification of that formerly used by Professor Beer, at Vienna ; the principal difference being in the length of the blade, the depth at

the shoulder being the same ; consequently from the point to the shoulder the depth of the instrument increases more suddenly. The advantage of this alteration is, that the section of the cornea can generally be completed by a single thrust, before the point of the knife reaches the nose ; whereas, in using Beer's knife, when the point has been carried as far as the nose will allow of, a considerable portion of the cornea still remains to be divided, beneath the edge of the instrument ; and it is difficult to complete the division of this part. The longer knife penetrates with greater facility, and if it be too short there is not sufficient draught for the acute edge to act as a cutting instrument.

The knife delineated, *fig. 2*, is of the form used by Dr. Wenzel. I have frequently employed it, but find that it does not cut with so much facility as the former.

It is important that the knife should be very carefully tempered, that it may not bend or break ; it should be firm and elastic, but not brittle ; this may be ascertained by trying it upon the thumb nail : it should also be ground of a wedged shape, thick at the shoulder, and gradually diminishing in thickness to the point, in order that it may fill the entire space of the wound it inflicts, and thus prevent an escape of aqueous fluid : by embracing the blade near the

shoulder, with the points of the thumb and forefinger, and gradually drawing the blade between them, from the shoulder to the point, any irregularity in the surfaces can be detected.

The point and cutting edge should be tried upon the skin of the finger or hand, to ascertain if they are sufficiently acute.

I find the curved knife which cuts upon the concave edge to be most serviceable ; but it is best to be provided, also, with one cutting on the convex edge : the extremity of the knife should be obtuse.

The sharp extremity of the curette should not be more curved, than is represented in *fig. 10* ; otherwise, it is apt to catch in the cornea or iris.

The sharp extremity of the small hook, *fig. 8*, should be bent a little towards the shaft of the instrument, to make its hold more secure.

OF THE OPERATION.

DURING the performance of the operation, I consider it advantageous to have the patient in a recumbent posture, so that the head comes to about the level of the lower part of the chest of the operator when he is seated ; for if the patient be in a sitting posture, with his face nearly on a level with that of the operator, he has

Position of
the patient.

sometimes to sustain a position of the arm which is extremely irksome, and likely to destroy that steadiness of hand so essential to ensure success. In many instances the patient has so little command of the eye, that a minute or more may elapse before the eye can be brought into a position favorable for the commencement of the section ; and very few can maintain the arm elevated and steady, even for so short a time.

Position of the operator.

The position of the operator, therefore, should be such as subjects him to the least possible degree of muscular exertion. In operating upon patients, in the sitting posture, I have several times experienced the inconvenience just adverted to.

Inclination of light.

The inclination of the light, as regards the eye submitted to operation, is a matter of considerable importance ; if it fall direct, as when a person is seated immediately opposite a window, the reflection is such as would be likely to impede the view of the operator : it is best to have the light from above, and to have the patient placed so that it falls obliquely, instead of directly, upon the cornea. Too much light creates a dazzling which is inconvenient ; that afforded by a window of ordinary size I usually find to be more than sufficient ; and I prefer having the lower half secured by the shutters, so that the light only passes from above. The view obtained of

the eye, by this means, is ample and more steady.

A light bandage should be placed over the eye not subjected to operation, to exclude the light, and to prevent a view of the operator.

Supposing that the right eye be submitted to operation, the surgeon should be seated at the head of the patient; and taking his knife in the right hand, he ought to hold it, as he should hold a pen or pencil. He should then raise and fix the superior lid with the fingers of the left hand, in the following manner. The point of the fore-finger should be applied to the centre of the margin of the lid below the cilia, so as to touch the surface of the globe: the lid should then be pressed upwards, towards the eyebrow; but, at the same time, the margin should be kept in contact with the globe, the point of the finger still resting on the globe; then the extremity of the middle finger should be applied upon the globe, near to the inner canthus; by this means the lid may be secured; and, by slight pressure from either of the fingers resting in the situation I have described, the motion of the globe upwards or inwards can be, in great measure, prevented. At the same time, the assistant should depress the lower lid, by placing the point of his finger on the integument of the cheek below the lid, so as to draw down the lid, by pressing the

Holding the
knife.

Fixing the su-
perior lid.

integument towards the angle of the mouth, without making any pressure on the globe.

Preparation to
commence the
section.

Being now prepared to make the section of the cornea, the surgeon, holding the knife as he would a pen, should rest the ring and middle finger of the right hand upon the temple of the patient, near the outer canthus of the eye ; and place the flat part of the blade of the knife upon the surface of the cornea, and try whether he can carry the point of the instrument to the nose, without shifting the position of the fingers on the cheek. By touching the cornea, the patient is warned of the commencement of the operation ; and should the eye, at this warning, become unsteady, (which it often does,) the surgeon should endeavour to attract the attention of the patient to any matter foreign to the operation itself ; thus, the patient may be asked how long he has had cataract, or if his father or mother were subject to such disease ; or any other question calculated to engage the mind for a few moments. This is much better than directing the patient to keep the eye fixed in any particular position, for it is almost impossible for him to do so, under the dread of the operation.

Whilst the mind is engaged in thought, the eye is naturally directed forwards or a little upwards, in a position favorable for the performance of a section of the cornea ; and it is there-

fore better to employ the mind in this manner, by some question irrelevant to the operation, as by it the eye assumes the position desired, without the patient being conscious of it.

As soon as the eye is directed so as to afford an opportunity for commencing the section of the cornea, the surgeon should introduce the point of the knife through the cornea, close to its junction with the sclerotic, without, however, touching the latter. Supposing he wish to make the section upwards, the point of the knife should penetrate the cornea, close to the external part of its tranverse axis, the edge of the knife being directed upwards; thus, in passing it through the anterior chamber, one surface is opposed to the cornea, the other to the iris. The point of the knife should be steadily and rapidly passed through the anterior chamber, until it again penetrate the cornea, at a point rather above the inner extremity of its transverse axis; and then carried on until it reach the inner canthus or the nose; or until the edge of the instrument have completed the flap of the cornea.

If a portion of the cornea remain undivided, and the operator find that he cannot carry the point of the knife further without wounding the inner canthus or the nose, he should complete the division of the portion that remains, by retracting the knife a little, and carrying it on

Making the section.

Completing the section.

again towards the nose, repeating this kind of sawing motion until the division be accomplished.

Pressure on
the globe
withdrawn.

As soon as the knife has penetrated the inner margin of the cornea, the surgeon is able to command the globe with the knife ; and, therefore, all pressure from the fingers is unnecessary, and, if continued, likely to produce serious mischief : for immediately the section is completed, and the knife free, slight pressure might occasion immediate escape of the lens, and part of the vitreous humor. The point of the finger should therefore be removed, as soon as the extremity of the knife has penetrated the inner side of the cornea. The motion of the hand, in performing this part of the operation, should be that of a rapid thrust with the fingers, rather than a dart with the hand ; by the former, the position and extent of the incision can be nicely regulated ; from the latter, there can be no certainty. It requires that the knife should be accommodated to the movements of the eye during this part of the operation ; the difficulty of doing this is extreme, and can only be acquired by much experience and considerable manual dexterity.

A common
cause of loss of
aqueous fluid.

Whilst the knife is passed through the anterior chamber, and until it has been made to penetrate the cornea on the side opposite to that on which it entered the chamber, the operator should not make any attempt to cut out or complete the

section, but merely observe that the blade has a proper direction, whilst by a steady and continued thrust he only aims at carrying the knife through the cornea and anterior chamber ; if an attempt be made to cut out, or form the flap, before the instrument has passed through the cornea on each side of the chamber, the aqueous fluid is nearly sure to escape, when the iris will bulge before the knife, and prevent the operator from completing the section : because in the endeavour to cut out, the back of the knife is brought from its contact with the undivided part of the cornea, and a part of the wound being thus left free, the aqueous fluid readily flows out ; this is a very common fault with young operators, and is best obviated by a little practice on the eye of the dead subject.

I frequently find that in making the section of the cornea, the muscles of the globe and palpebræ act violently, either by the effort of the patient, or involuntarily ; and under such circumstances, I usually wait for a few moments, after the knife has passed both sides of the cornea, when I can readily command the globe, and the iris is out of danger ; the inordinate muscular action soon subsides, and then the section can be completed without risk ; supposing that the section be completed during this muscular effort, the lens and vitreous fluid in large quantity may

Spasmodic
action of
muscles.

be forced out through the opening in the cornea, immediately that the knife be withdrawn; this I have often witnessed.

Extent and
position of the
section.

By the incision, the cornea should be divided to nearly one-half of the extent of its circumference, close to its junction with the sclerotic; and this immediately allows of the escape of the aqueous humor. I have given fair trial to three different sections of the cornea,—first, I performed that usually adopted at the time I commenced my operation on the eye; it was downwards: secondly, I made the section upwards, in a great number of cases; and, thirdly, I have tried an oblique section so as to make the flap of the cornea in a direction downwards and outwards. Necessity alone would compel me to make the flap downwards again, by the lower section: of the two other plans, I rather prefer the last, because, when prolapse of the iris takes place after the operation, to such an extent as to displace the pupil, vision is more useful and perfect if the pupil be drawn downwards and outwards, than when it is drawn upwards.

Assistant to
command the
superior lid.

Provided that the surgeon have to operate on the left eye, and he be incapable of using his left hand, he will be compelled to place the management of the superior eyelid, in the hands of the assistant. The assistant, in performing this duty, should elevate the lid, and rest the points of the

fingers on the globe, as previously directed to be done by the surgeon himself. He should watch, attentively, the passage of the knife through the anterior chamber, and quit all pressure, as soon as he sees the point of the instrument on the nasal side of the cornea. Unless accustomed to this duty, or well instructed previously, the assistant is apt to become absorbed in the progress of the operation, and to forget that he himself is concerned in it; so that he makes more pressure than is required, and continues it after the section is completed, and creates the mischief above mentioned; or he may, on the contrary, not afford sufficient support to the lid, and allow it to slip from his fingers.

Experience has convinced me, that great advantage results from a capability of using both hands with facility, as it places the operator independent of an assistant; for the operator who is ambidexter can always take the command of the superior eyelid himself, and make the section in either manner I have described, using the knife either with the right or left hand, for the right or left eye. If he wish to make the lower or oblique section, he has only to cut from, instead of towards, himself.

Advantage of
being ambi-
dexter.

The patient should be allowed to rest a few moments, after the section of the cornea has been made.

Laceration of
the capsule.

The next step in the operation is to lacerate the anterior capsule, which is effected with the sharp extremity of the curette. The superior lid is again to be raised, but merely by the integument which is to be pressed against the eyebrow. The curette is to be held as the knife, and as soon as the section is exposed, the extremity of the instrument is to be passed beneath the flap of the cornea, with the convex part towards the iris; so that the point cannot become entangled in it. When it has reached the aperture of the pupil, the point is to be turned upon the central part of the capsule of the lens, and made to penetrate it. The aperture in the capsule is to be extended, by moving the instrument so as to make its extremity describe a circle, corresponding nearly to the size of the pupil. In doing this, the less the lens is disturbed the better. The instrument is then to be withdrawn, with the convex part again towards the iris.

Extraction of
the lens.

The patient is again to be allowed to rest for a few moments; after which, the surgeon should place the blunt end of the curette upon the superior eyelid, and press it in the direction between the superior part of the orbit and the globe, upon the globe; at the same time, the point of the finger should be made to press the globe, corresponding to the central part of the inferior lid. By this counter-pressure, the lens is made to

quit its capsule, and to escape through the pupillary aperture of the iris, and then through the wound in the cornea.

To dislodge the lens, in the first instance, requires rather firm pressure ; but as soon as its greater diameter passes the opening of the pupil, the pressure must be lessened, or entirely removed ; otherwise, the hyaloid membrane is likely to give way, and the vitreous humor flow out.

As the lens escapes, the lid should be allowed to fall, and after resting a few moments further, the operator should apply the point of the forefinger upon the superior lid, and employ slight friction which should influence the surface of the globe. This is for the purpose of stimulating the iris, to promote contraction of the pupil. The patient may then be directed to open the eye, to give the surgeon an opportunity of seeing that the flap of the cornea is properly adjusted, and that the iris has recovered its proper position. At this time, the patient frequently discerns surrounding objects of magnitude ; but I consider it very imprudent to induce the patient to exert the organ for visual purposes : for no satisfactory opinion can be formed, respecting the degree of vision likely to be recovered ; and the effort is, in my opinion, likely to excite inflammatory action.

Application of
bandage.

If the flap of the cornea be nicely adjusted and the pupil circular, the sooner the eye is closed the better. Both eyes should then be covered with a piece of soft linen, in three or four layers, which should be secured by a broad ribbon. If the patient be in the habit of wearing a night-cap, it should be placed on the head before the ribbon be applied. The ribbon should be sufficiently long to reach once and a half round the head; the central part of it should be placed at the back of the head or the night-cap, and the ends brought forward, so as to confine the piece of linen over the eyes. The covering over the eye which has been operated upon, should be the first secured. The portions of linen should be connected to the ribbon by small pins; and the extremities of the ribbon secured either to the night-cap, or to the ribbon, on the sides of the head, by the same means. Care must be taken not to apply the ribbon too tight, so as to press the eye; but at the same time, sufficiently so, to prevent it slipping. If the patient do not usually wear a night-cap, I secure the ribbon further, by an additional piece passed over the summit of the head, and attached, at its extremities, by means of pins, to the circular ribbon near the temples.

Linen moist-
ened injurious.

Some surgeons moisten the linen which is applied over the eye, with a little water, or a cool-

ing lotion ; and keep it wet, by the application of the same fluid through the ribbon. I am convinced that this continued use of cold is, in many instances, very prejudicial, inducing neuralgic or rheumatic affections. I have now, for several years, employed soft dry linen, and am satisfied that it is the best application.

A few minutes after the application of the bandage, the patient may be assisted to bed. Position of the patient in bed. Whilst the clothes are removed, he should be as passive as possible, and especially avoid stooping. He should be placed upon his back, in the bed, prepared as has been described, with the head and shoulders raised ; and the light should be excluded, either by closing the shutters, or drawing the window curtains. If the patient have been in the habit of sleeping with the bed curtains closed, they will sufficiently exclude the light ; but if otherwise, the patient is apt to get restless and heated, when they are drawn.

The patient should be directed not to talk, or to blow the nose ; and to suppress, if possible, any inclination to cough or sneeze ; also to be very careful not to touch the eye. To avoid any exertion.

Some persons have such a habit of rubbing or pressing the eye, that they are unconscious when they do it ; with such persons, it is best to confine the motion of the hands, by tapes fixed by one extremity to the side of the bed frame, and Hands to be secured.

by the other to the wrist, and of sufficient length to allow the patient to carry the hand to the mouth, but no higher. I have several times known mischief to occur, for want of some precaution of this kind.

I have, in a few instances, used a light wire gauze mask fitted to the upper part of the face, so as to prevent the patient from touching the eye, but the tape effects all that is desired, by checking the hand, and giving warning whenever an attempt be made to reach the eye.

Application of
belladonna be-
fore operation.

It is recommended, by some, that the iris should be placed under the influence of belladonna, previously to the performance of this operation; but I do not see what advantage can be gained by it; on the contrary, I think it occasions inconvenience; for instance, in passing the knife through the anterior chamber, if the aqueous humor escape, there is more risk of the pupillary margin of the iris being caught by the edge of the knife when the pupil is dilated, than when it is contracted: and further, if the iris prolapse through the section, I do not consider that it recovers its proper position with as much facility, when it has previously been under the influence of belladonna, as when the narcotic has not been used.

DIFFICULTIES OF THE OPERATION.

MUCH difficulty arises from being unable to get Eye irritable. the eye into a favorable position for commencing the section of the cornea. In the majority of cases, this arises from mental influence, as before mentioned, and must be obviated by the means described. But when it occurs from natural irritability of the organ, it is only to be in a degree corrected, by pressure with the points of the fingers ; and the difficulty of the operation is therefore much increased.

In making the section of the cornea, when the Escape of aqueous fluid. knife has entered the anterior chamber, if it be in the slightest degree retracted, or the eye be allowed to escape from it, the aqueous humor flows out, and the iris approaches the posterior surface of the cornea. This may occur at any time after the knife has penetrated the cornea ; and it is sure to take place if the surgeon do not keep the knife steadily carried on so as to fill the space it has divided, and at the same time follow closely the motions of the eye.

Operation
deferred.

Iris liberated
by irritating
the globe.

Should this accident occur when the knife has made but a small aperture, it is best to withdraw the instrument, and defer the operation; as it cannot be completed without great risk. But if the knife have crossed the anterior chamber, and effected a large aperture when the iris arises beneath the cutting edge of the instrument, the surgeon may perhaps liberate the iris, by irritating the globe with the point or nail of the forefinger. Should this not succeed, the knife ought to be withdrawn, and the section completed by the curved knife in the following manner.

Use of the
curved knife.

The extremity of this instrument is to be carefully introduced through the aperture previously made, and kept close to the posterior surface of the cornea, to avoid as much as possible friction or pressure of the iris; then, by carrying the cutting edge to the extremity of the wound, and withdrawing the knife a little, the incision is extended; and these motions are to be repeated until the aperture be of sufficient size to admit of the extraction of the cataract.

The cornea should be divided as much as possible in the direction previously intended.

Scissors to
complete the
section.

For this purpose some surgeons recommend the use of scissors, having one probed extremity which is to be introduced into the anterior chamber. The principal objection to such an instrument is, that the wound it inflicts will not

unite so readily, as that made by the knife ; and, in my opinion, the instrument is not so easily commanded.

There has been invented also, for this purpose, ^{Double bladed knife.} a double bladed knife, consisting of two thin blades nicely adapted to each other, but one being rather larger than the other ; the larger is altogether blunt, whilst the smaller has an acute point and one sharp edge, and can be projected beyond the larger, by moving a slide in connection with the handle. It should be introduced with the smaller blade upon the larger, so that the former cannot act as a cutting instrument. It should be passed between the iris and cornea, until the extremity of the large blade reach the side of the anterior chamber, opposite to that at which it entered. Then the smaller blade should be propelled on, by pushing the slide ; and, passed through the cornea, so as to complete the section. This is a difficult instrument to manage ; and, from its size, is likely to press or bruise the iris, so as to produce subsequent inflammation.

If an assistant have the command of the upper ^{Superior lid} lid, and allow it to slip at the time that the surgeon is making the section of the cornea, so as ^{not properly secured.} to prevent him from seeing the direction which the knife should take, the instrument should be withdrawn, and the operation deferred ; or the section completed with the curved knife.

Section too
small.

When the section is completed, and the anterior capsule lacerated with the curved extremity of the curette, the surgeon, by pressure upon the globe, endeavours to force out the cataract; but the lens does not always escape as I have described; and if the pressure be continued, a portion of the vitreous humor may be forced out. This happens when the section of the cornea is too small; when there are adhesions in the pupillary margin of the iris which prevent its dilating to admit the passage of the cataract; or when from rupture of the hyaloid membrane, or change in the consistency of the vitreous humor, the cataract becomes dislocated posterior to the iris.

To be
extended.

The first evil may be remedied by extending the incision by means of the curved knife; it is better to have the incision rather too free, than so small that a good deal of force be required to press out the cataract: for then it escapes in a broken condition, leaving often considerable fragments behind; and the violence done to the iris, by the passage of the cataract, induces inflammation: but if the lens cannot escape, the hyaloid membrane tears, the vitreous humor in part escapes, and the lens is displaced. This fault is readily ascertained, by observing what takes place when the pressure is made to promote the escape of the cataract; for if the cata-

ract present itself and partly protrude through the aperture of the pupil, and then become stationary, it is because the section of the cornea is not free enough to admit of its coming further.

When the escape is prevented by adhesions in the pupillary margin of the iris at the time that pressure is made to cause the protrusion of the cataract, the iris bulges forward; but the pupil does not dilate, excepting perhaps at one part; although the flap of the cornea be raised so that the surgeon is enabled to see that the section is sufficiently capacious. If the adhesion of the iris be but of small extent, it may be liberated by the sharp extremity of the curette; but if it be extensive, it becomes necessary to enlarge the pupil by a partial division of the iris. This is to be effected with a pair of fine scissors having probed extremities, as invented by Maunoir, of Geneva. The extremities are to be introduced closed, beneath the flap of the cornea, until they reach the pupil, when the blades are to be separated; and one passed before, and the other behind the iris. The distance to which they are to be carried, must depend upon the extent of iris the surgeon may wish to divide; which is readily done by bringing the blades together; after which, the scissors being withdrawn, the cataract escapes under the ordinary pressure.

Iris adherent
to capsule of
the lens.

Iris wounded
forming a
second pupil.

I have seen the iris wounded, in making the section of the cornea, so that an opening resulted between the site of the original pupil, and the attachment of the iris to the ciliary ligament; in consequence of which, when pressure was made to promote the escape of the lens, it presented itself at the artificial aperture, and became entangled. In this case, it was necessary with the scissors to form into one the original and artificial openings, before the cataract could be disengaged.

Capsule not
lacerated.

It may happen that the cataract does not obey the pressure, in consequence of the capsule being entire; in such case, when pressure is employed, the iris will bulge forward, and the pupil expand. It is merely necessary to introduce the sharp end of the curette, and use it with a little more freedom than before, to effect an opening in the capsule.

Lens
dislocated.

It occasionally happens either when the curette is pressed upon the capsule for the purpose of puncturing it, or when pressure is made to bring forward the lens, that it becomes displaced behind the iris; and if the force be continued, the vitreous humor flows out. This is an exceedingly difficult case to manage. Supposing that the cataract be still visible through the aperture of the pupil, the surgeon should introduce the small hook, with as little violence as

possible, keeping its convexity to the iris, whilst he passes it through the anterior chamber. He should direct it through the pupil, and, if possible, get the extremity beneath the cataract, and hook it, and bring it through the pupil and aperture of the cornea. In doing this, there is great risk of loss of vitreous humor in so large a quantity, as to cause destruction of the eye. When once the hyaloid membrane is broken, and the humor is more fluid than usual, the slightest pressure, or even sudden movement of the eye, occasions a loss of a small quantity. It is impossible to complete this operation without some pressure; and the result, therefore, mainly depends upon the celerity and manual dexterity of the operator.

In some cases, in which I have had to remove the displaced lens, with the hook, there has been subsequent hæmorrhage to such an extent as to destroy the eye. In every instance, the section of the cornea was ample, and completed without injury to the iris; but in using the curette to lacerate the anterior capsule, the lens became displaced.

Hæmorrhage
from central
artery.

128. In one case, when I had brought away the cataract with the hook, which was effected with a very trifling loss of vitreous humor, I observed at the margin of the pupil a small quantity of blood, which, at the time, I thought

Case.

might have resulted from slight injury to the iris by the hook ; although I was not aware of having wounded that membrane. Soon after the patient had been placed in bed, severe pain came on ; and, on removing the bandage, blood was discovered oozing through the palpebræ which appeared to be enormously distended : upon gently separating them, the hæmorrhage became greater, and it could be perceived that the globe was filled with blood, the flap of the cornea being raised by coagulum. By keeping the patient erect and constantly applying cold water, the bleeding, after some time, subsided ; but suppuration afterwards occurred in the globe, and it collapsed.

Case.

129. In another case, the bleeding commenced as soon as the lens was displaced, and I was satisfied that the iris had not been injured. The case terminated as the former ; the hæmorrhage continuing for two or three hours after the operation, during which time the globe became filled with blood, and suppuration subsequently ensued. I believe, in these cases, that the bleeding took place from the branch of the central artery of the retina, which supplies the posterior capsule of the lens. I cannot account for it in any other manner, nor can I propose any remedy likely to check the hæmorrhage, in a similar case, with the chance of preserving vision.

130. I have seen a few other cases very similar to those I have mentioned; the last which occurred, was in an elderly female, and differed from the others, inasmuch as there was not any displacement of lens, or loss of vitreous fluid, previous to the hæmorrhage. I had extracted the cataract, and had exposed the eye afterwards, so as to satisfy myself and the students, that the pupil was clear and circular, and that the flap of the cornea was well adjusted; I had applied the bandages, and the patient had been raised from the recumbent posture, when the hæmorrhage was first observed; she lost several ounces of blood of a bright florid color.

In all instances in which such bleeding has occurred under my own observation, the cataracts had been formed for a long period.

Supposing the cataract to sink out of view, the surgeon had better leave the case; as it is possible that the section may unite, and the patient recover useful vision—the lens resting in a position where it does not interfere with vision, or give rise to inflammation: for it is improbable that the surgeon will succeed in removing it, without occasioning so great a loss of vitreous fluid, or exciting acute inflammation; either of which would destroy vision.

In the passage of the cataract through the aper-
Fragments of
lens remain.

Case.

Lens sinks
in vitreous
humor.

ture of the pupil, some portions are occasionally broken from the circumference, which may remain after the larger mass has been brought away. These fragments may remain either anterior, or posterior, to the iris. If they be anterior to the iris, they should be removed by the blunt extremity of the curette; because they are apt to excite irritation and inflammation, if allowed to remain in contact with the anterior surface of this membrane; but if posterior, I think it better to allow them to remain, as they are readily absorbed under the influence of the aqueous humor, after the section has united; whereas the attempt to remove them, may occasion prolapse of the iris, or a loss of vitreous humor.

Opake capsule
remains.

Should an opake capsule remain after the extraction of the lens, no attempt, in my opinion, should be made to extract it; for the same reason that I have given, when speaking of the fragments of the lens behind the iris. In an attempt to extract the capsule, the danger would be greater, than in trying to remove the fragments of the lens.

Protrusion of
the iris.

After the removal of the lens, the iris sometimes prolapses through the section; if it do so, the surgeon should first try the effect of slight friction on the superior lid, as I have before mentioned. If this do not succeed, it is probable

that the iris is entangled in the section ; or that the pressure of the recti muscles forces forward the vitreous humor, and prevents the return of the iris.

In the first instance, the surgeon should cautiously return the iris within the section by the blunt end of the curette : but if it again prolapse immediately the support of the instrument is withdrawn, he should allow the patient to rest for a few minutes, in order that the pressure from the action of the muscles may subside. But if he cannot then succeed in reducing the protrusion of the membrane, he may evacuate a small part of the vitreous humor. Unless he have a very steady hand, this is a dangerous experiment, inasmuch as it is difficult to regulate the quantity which flows out. I have several times adopted this plan, and with success. I consider less mischief likely to ensue from the loss of a part of the vitreous humor, than would result from continued protrusion of the iris.

By far the most difficult part of this operation, under ordinary circumstances, is that of making the section of the cornea : the difficulty consists in avoiding the iris, which it is highly important to do ; for a wound or bruise of this membrane may produce inflammation, which may defeat the object of the operation. It is

Vitreous
humor in
part let out.

true, that the iris is frequently injured, without occasioning much subsequent mischief ; but, nevertheless, the danger of such injury must be obvious.

Protrusion of
hyaloid mem-
brane.

When the vitreous humor is forced out, it is sometimes accompanied with a protrusion of the hyaloid membrane which hangs through the section, partly distended with vitreous fluid, appearing as a fine vesicle. This, of course, prevents the contact of the divided surfaces of the section of the cornea. It may be mistaken for a portion of the vitreous fluid adherent to the section ; and the operator, under this impression, may make attempts to wipe it away. This only leads to a further protrusion of the membrane, and an additional loss of the humor. He ought to endeavour to return the protruded membrane within the anterior chamber, with the blunt extremity of the curette ; but if he find that it prolapses again as soon as the support of the instrument be withdrawn, he should carefully cut off the protruding part with a fine pair of scissors. It will generally interfere with the union of the section of the cornea ; but is not likely, in my opinion, to create so much mischief, as the repeated attempts either to remove it entirely or return it, would do. Indeed, these efforts would rarely succeed if continued.

There are two points connected with this subject which I consider of importance, and upon which, therefore, I shall offer some remarks.

First,—the best period or season for the performance of the operation.

Second,—the condition of the disease most favorable for operation.

First,—I am perfectly satisfied that the operation is most hazardous, during the cold and damp seasons ; so much so, that it is only under very particular circumstances that I now operate for extraction, in the period from October to March ; the proportion of unsuccessful cases has been very much lessened, since I have discontinued to operate in the cold and damp periods of the year.

Second,—I have for many years recommended, and practised this operation, in cases in which the disease has proceeded so far as to destroy useful vision ; provided that the favorable season be arrived, I do not think it proper to operate upon one eye of an elderly person, whilst the other remains perfect ; for it may happen, that the second eye does not become affected by cataract : very rarely indeed, however, does this contingency happen ; for, usually, when cataract occurs spontaneously in one eye, the second evinces similar disease, before the vision in the organ first attacked, be lost. I must suppose,

then, that cataract is perfectly formed, or nearly so, in one eye ; that the vision of the other is somewhat misty ; and that the commencement of cataractous opacity can be distinctly seen in the lens ; I should, under such circumstances, advise an operation for the removal of the lens, in which the disease obscured all useful sight ; unless the unfavorable season were present.

It is the practice of several ophthalmic surgeons to delay operative measures, until the patients have lost all useful vision, with both eyes ; and they, then, extract both cataracts, on the same day. I know of no good and sound reason for such practice ; but, on the contrary, find several strong arguments against it.

The patient, if he have to wait for operation, until both cataracts are completely formed, necessarily passes many weeks, or months, in a state of dependence ; and is, in great measure, prevented from the degree of exercise requisite to maintain a good condition of health. He often becomes nervous and irritable under such circumstances.

But the most important subject for consideration is the risk of the extraction, which, in my opinion, is materially increased by a double operation. Every one is familiar with the close sympathy which exists between the two organs ; and the ophthalmic surgeon ought to be aware,

how prone one organ is to take on a morbid action, which has originated in its fellow. In the operation, there is not only the immediate risk of the operation itself, but also the risk of subsequent casualties ; by which, I believe, the organ is more frequently destroyed, than by the direct effects of the extraction.

If the eye be occasionally lost in consequence of inflammation produced by the operation, or by some subsequent injury, or accidental circumstance, when one eye only has been subjected to operation, it will, doubtless, happen, when the double operation has been performed ; and, in my opinion, the risk of such untoward result is more than doubled, when both eyes are submitted to operation, at the same time.

Theory, however, in reference to such matters, is valueless, in comparison with a few facts ; and it is a fact, that both eyes have been frequently lost when submitted to operation, at the same time ; and even where the operators have been skilful and experienced. In such cases, it cannot be disputed that the patients would have had a better chance of restoration of vision in one eye, had not such imprudent proceeding been adopted.

I have found, in a few instances, that, in spite of all my care and enquiry, some circumstance of importance, as regards the habits or condition of

the patient, has been withheld, or unintentionally misrepresented ; which has been a principal cause of non-success, after operating on one eye ; and that such circumstance, being elicited, during the treatment after the first operation, has enabled me to adopt measures to prevent its injurious influence, when I have operated upon the second eye.

Such are some of the principal reasons for my not recommending operation on the two eyes, at the same period.

I have performed the double operation, in a few instances, under particular circumstances, at the solicitation of the patients, and have not had an unsuccessful case : but still, I cannot recommend the practice ; and would never adopt it, unless by desire of the patient, after I had stated my objections to it.

TREATMENT AFTER THE OPERATION.

SOON after the bandages have been applied, subsequent to the operation of extraction ; the patient should be placed in bed, or in a comfortable and easy position : when there is a careful attendant, I prefer that the patient should not

go to bed ; but be placed in an easy chair, or upon a sofa, in a half erect posture, when he can be more readily amused, till his usual period of rest ; otherwise, he is apt to sleep or doze, so much, as to prevent his having a tranquil night. Whether he remain up, or go to bed, the patient should have the head and shoulders well raised and supported, to prevent excess of local determination of blood to the wounded organ ; and when in bed, he should be directed to lay upon his back, or incline a little on the side opposite to that in which the injured eye is seated.

If the patient have been in the habit of taking Narcotics. an opiate, or if he be inclined to restlessness, I consider it prudent to administer a full dose of a narcotic, in the evening, after the operation ; I prefer, in these cases, either the sedative solution of opium, or the black drop : of the former, the dose should be from thirty to forty minims ; and of the latter, from twenty to thirty minims. This treatment would be of course improper, if the patient have before found that narcotic medicines disagree with him,—which it is important to ascertain.

The patient should not be allowed to talk, or to take any kind of food requiring mastication. Action of muscles.

For the first twenty-four hours after the operation, the patient usually experiences a sensation in the eye, as if it had been bruised ; and Sensations usually felt.

occasionally feels, if the eye be suddenly moved, as if some extraneous matter were lodged between the surface of the eye and the eyelid. Sometimes a degree of uneasiness is felt ; which is followed by the escape of fluid from the palpebral aperture ; immediately after which the uneasiness subsides. The patient should be informed of these circumstances, otherwise he may become unnecessarily alarmed ; and he should be told that if he experience any continued, or if he feel any acute, darting pain, he should immediately complain of it.

Eyelids to be
cleansed.

The eyelids should be occasionally cleansed with a little tepid water ; and if there be any disposition to coagulation of the secretions upon the margins of the lids and the cilia, these parts should be lightly moistened with some simple ointment, to prevent them from adhering. The application of this should be repeated, whenever the part has been cleansed with the warm water. In the use of the water, or of the ointment, great care should be taken not to press the globe of the eye.

Symptoms of
acute inflammation.

When acute pain comes on within a few hours after the operation, it generally indicates the commencement of acute inflammation ; and should be met by the abstraction of blood, generally or locally, according to the power of the patient. When he does not possess much general

power, or when the local symptoms are not very severe, a cupping-glass should be applied behind the ear ; or leeches about the inferior margin of the orbit. The former means of abstracting blood is preferable, in consequence of the latter so generally producing tumefaction of the lids.

When the pain is acute, and the general power good, the inflammation is more effectually checked, by taking blood from the arm. During its abstraction, the patient should sit up, and the blood be allowed to flow, until some impression be made upon the pulse. It is very desirable to avoid the production of syncope ; because it frequently occasions a sympathetic affection of the stomach ; and induces vomiting, which would probably injure the eye.

All the ordinary means, to check inflammatory action, must be further resorted to, if the symptoms of inflammation continue ; excepting two, namely, the use of mercury, so as to affect the system ; or the use of nauseating medicines. The one would prevent the union of the section of the cornea, by checking the adhesive process ; the other, by occasioning vomiting, might cause the loss of vitreous humor. Therefore purgatives with abstinence, and a repetition of bleeding, must be principally relied on.

When the symptoms of inflammation do not occur, until the expiration of thirty or forty

General bleed-
ing.

hours after the operation, the nature of the inflammation must be ascertained, before any treatment be adopted. The bandage should be removed, and the condition of the eyelid first examined ; and, at the same time, the character of the secretion which escapes from between the palpebræ should be ascertained.

Appearances
of acute dis-
ease.

If the eyelids be swollen, and of a florid red color, and be extremely tender to the touch, with a thick yellow secretion upon the cilia, and at the inner canthus, the inflammation is of an acute kind. When the eyelids are separated, which should, if possible, be effected by the natural effort of the muscles, without pressure of the fingers, the conjunctiva will be found red and swollen, or chemosed ; no time should then be lost in adopting the treatment just described.

Appearances
of chronic dis-
ease.

But if the palpebræ, although swollen, be but little discolored, and appear as if the cellular tissue were partly filled with serum, rather than the vessels distended with blood, and the secretion about the cilia and inner canthus be thin and white, or of a light yellow tinge, the inflammation will be sub-acute ; and upon the eyelids being separated, the conjunctiva will be found but slightly discolored, and raised by deposition of serum in the cellular tissue between it and the sclerotic. This condition of the membrane is called *Serous Chemosis*. If a view of the section

can be obtained, it will be found but slightly adherent, and the neighbouring portion of the cornea hazy ; perhaps, also, a little ill-formed matter may adhere about the surface of the section.

In these cases, the pain and suffering are sometimes as severe as in the former instance : and are, therefore, apt to deceive the surgeon.

In the acute cases, the system soon sympathizes ; the action of the heart and arteries becomes much increased with general febrile excitement ; but in the sub-acute disease the pulse is feeble, although it may be quick ; the extremities cold ; and, often, a feeling of depression. The sub-acute disease is just as likely to destroy the eye as the acute, unless properly and timely managed.

Constitutional affection.

I usually, at first, give the carbonate of ammonia, and combine it with opium, if the patient be restless ; and, instead of keeping the patient upon a very spare diet, I allow him to take freely of good broth, or other nutritious matter, in solution, that he may fancy. I have, several times, allowed patients, under these circumstances, the moderate use of beer, wine, or spirits, whichever they may have been previously in the habit of taking ; trusting much more to nutritious diet and ordinary stimuli, than to medicinal stimuli. By giving eight or ten grains of the carbonate of ammonia in a little mint-water, with or without the opium, as may be thought proper, the

Treatment of sub-acute disease.

surgeon is enabled to judge of the nature of the case more accurately ; as, in the sub-acute disease, the patient nearly always experiences some degree of relief, soon after the dose has been administered ; but, in the acute case, the symptoms become aggravated : I have seen the lids edematous, the conjunctiva with serous chemosis, the section covered with ill-formed matter, the cornea hazy, and the patient suffering from acute pain ; and, after eight and forty hours from the commencement of the treatment I have just described, all these parts have re-assumed their natural characters, and the section of the cornea has been firmly adherent.

Case.

131. I extracted a cataract from the left eye of a man, aged seventy-two, on a Friday morning at ten o'clock ; he had been an inmate of the Ophthalmic Hospital, for more than three weeks previously ; his general power being so feeble when I admitted him into the house, that I deemed it necessary to increase his strength, before I performed the operation. I, therefore, allowed him animal food daily, and some porter. On Sunday morning early, our house surgeon called upon me, to say that the patient had passed a restless night ; that he had suffered much from severe pain in the eye ; and that the palpebræ were swollen. I immediately went to see the man, and found him still complaining

of great pain in the eye and head; the eyelids were swollen, and of a dull red color; and a quantity of white and thin muco-purulent secretion was apparent on the cilia, and especially at the inner canthus; the conjunctiva was red; serous chemosis, of considerable extent, existed; the section of the cornea was partly open; and the edges of it were loaded with an unhealthy opake secretion: the globe was very tender to the touch; and the patient was restless and thirsty: his pulse quick, irregular, and easily compressible; and his hands felt dry and cold. On enquiry, I learnt that he had not had any thing but gruel since the operation; for I had not given any particular directions about his diet, &c.; and the house-surgeon, who had but recently become attached to the Institution, and therefore not acquainted with my practice, had merely allowed the diet usual after such operations.

Being satisfied that the local mischief arose from deficiency of general power, I gave the man, directly, ten grains of carbonate of ammonia, half a drachm of the sedative solution of opium, and ten drachms of camphor mixture; and directed that some good strong broth should be prepared for him; of which he was to take two pints in the day, and one pint of porter. Within an hour after taking the medicine, the

patient went to sleep ; and slept tranquilly for several hours ; when he awoke, he was free from pain, and took a pint of broth, and a glass of porter ; and the same again in the evening : the following night he slept well, and when I visited him early in the morning, he said he felt perfectly easy : the tumefaction of the palpebræ had subsided, and they presented their natural aspect ; very little coagulated secretion was adherent to the cilia, and at the inner canthus ; the serous chemosis was gone ; and the section of the cornea was closely adapted, and firmly adherent. I ordered him some more broth with meat in it ; and another pint of porter. On Tuesday there was no trace of the previous mischief ; the patient was convalescent ; and he left the hospital, in a fortnight, with a good eye, and excellent vision.

Had I judged by the local suffering, and tenderness of the eye ; and the swollen state of the palpebræ, without reference to other circumstances, I should have depleted the patient ; and have, thereby, caused destruction of his eye.

Case.

132. In the summer of the year 1835, I operated upon one eye of a gentleman, aged nearly seventy ; he was of a spare habit, and had rather a weak circulation ; but stated that he had usually enjoyed good health, and that he had always been moderate and temperate in his

living. After the operation, I allowed him to take some good soup, but no wine or beer ; and for four days he had not any untoward symptom ; the section of the cornea appeared to be well united, and his vision was good ; though I did not permit him to make use of it. On the fifth day, I was surprised to find that he had suffered from severe pain in the eye, on the preceding night ; and that the palpebræ were much swollen, and slightly red ; on exposing the globe, a little thin opake secretion escaped from the conjunctival surface ; the conjunctiva appeared red and elevated by serous deposit ; and the section of the cornea was found open, with a small portion of the iris protruding through it. I suspected that the patient had received some violence to the globe, which had burst the section ; but, on hearing the particulars of the unfavorable change, I was soon satisfied, that no injury had been inflicted.

The gentleman had felt unusually depressed, on the previous evening ; and soon after he had gone to bed, his eye began to feel uneasy ; and this uneasiness had gradually augmented, until it amounted to pain, sufficient to cause great distress, which continued at the time of my visit to him ; and, at this time, his pulse was very feeble ; he felt chilly ; and complained of excessive muscular debility, and depression of spirits.

I immediately directed the patient to take some warm brandy and water ; and prescribed a mixture of compound spirits of lavender, tincture of opium, and camphor mixture ; of which he was to take a dose, every three or four hours, so long as the feeling of excessive debility existed ; I advised him to have small quantities of nutritious food frequently in the day, with wine, or brandy and water, as he felt inclined ; in the course of the day the suffering subsided, and his general feelings became more comfortable ; but I was obliged to continue the use of the medicinal and general stimuli for a few days, before the local action became healthy : in the mean time, however, the ocular mischief did not extend. The gentleman recovered, with good vision, though with a disfigured pupil ; but nearly three months elapsed, before the section was perfectly and securely closed.

In this case, again, the urgency of the local symptoms might have induced an inexperienced practitioner to use depleting measures, which would have been fatal to the eye, and perhaps to the patient.

Such cases, if neglected or mal-treated, usually terminate in suppuration of the globe ; and extensive ulceration of the cornea.

Protrusion of iris from injury. Within the first two or three days after the operation, there is much risk, from any sudden

exertion, such as coughing, sneezing, straining, &c., or from a slight blow, or pressure, upon the eye; for the section of the cornea may give way, and a portion of the iris prolapse; and this, unfortunately, cannot be remedied, by any of the means I have described, when speaking of its occurrence in connection with the operation. Although the protrusion of the iris cannot be reduced, means must be taken to prevent its increase, and to check the inflammation which it sometimes creates. The most effectual means of preventing its increase is to excite a deposition of adhesive matter: this deposition, sometimes, takes place spontaneously; and is indicated by the edge of the section becoming opaque where in contact with the protruded iris: if inflammation arise, this usually happens. When the cornea does not exhibit this appearance, although the eye may be irritable, and some degree of ophthalmia apparently exist, it is right to use a local stimulant; for whilst the cornea remains perfectly transparent, there is not sufficient action going on. Perhaps the most effectual application is the nitrate of silver in substance; a portion of which should be pointed, like a pencil, and placed immediately upon the protruded membrane; when it acts beneficially, by lessening the projection, as well as by exciting a proper action. There is, however, much danger

in its use ; for the pressure, necessary to expose the seat of the prolapse and to fix the eye, will, under these circumstances, probably induce a further protrusion. As it is extremely desirable to prevent such an occurrence, I prefer the application of the remedy in solution, by means of a syringe. The strength of the solution may be from two to eight or ten grains of the nitrate of silver in an ounce of distilled water ; the strength of the solution being used in proportion to the deficiency of local action. It can be applied without the risk which attends the employment of the nitrate of silver itself.

Mode of
injecting.

The surgeon, having a slender pointed syringe filled with the solution, should direct the point close to the cilia of the affected eye ; and then desire the patient to open the eye, and immediately that the projecting iris is exposed, a jet of the solution should be thrown upon it. The pain from this application is not so severe, as when the substance is used. It usually subsides, after a few minutes ; but, if it continue beyond that time, it will be relieved by bathing the eye with a little tepid water.

The eye should be examined five or six hours after the solution has been injected ; and, if sufficient action have not been excited, the application should be repeated.

I have found it necessary, occasionally, to

make use of this remedy three or four times, before it has produced the necessary degree of inflammation ; and I have, usually, increased the strength of the solution a little, when the second injection has not been effective.

When adhesion has taken place, even in a slight degree, the nitrate of silver in substance may be safely employed ; and it should be used when the progress of the case is tedious.

The effect of the prolapse, however trifling it may be, alters the position and figure of the pupil ; and, if it be to a great extent, the pupil is entirely destroyed.

In persons of rheumatic or gouty diathesis, the operation of extraction sometimes induces inflammation of the sclerotic, and iris ; which may be recognized by the symptoms and appearances described under the subject of inflammation of the sclerotic, and iris ; and should be treated in the manner there explained. It is, however, usually more obstinate than the ordinary form of the disease ; and, sometimes, in spite of the utmost care, produces a closure of the pupil. It seldom occurs, until four or five days after the operation ; and I think it is often produced by the application of cold lotions ; or by improper exposure of the eye ; for formerly, when we used, at the Eye Infirmary, to moisten the linen applied over the eye with cold water, or

Inflammation
of the sclero-
tic coat.

a cold lotion, this disease was frequent ; but since I have, at the suggestion of some German physicians, merely used the simple dry linen, the affection has been comparatively rare.

Inflammation
of the iris.

Inflammation of the iris is also a consequence of the operation, when the membrane has been bruised or wounded. The symptoms and characters of the disease are the same, as described under the head of iritis : but we cannot make use of the remedy, which is there shewn to be so efficacious in arresting and subduing that disease ; for if we use mercury freely, it is likely to prevent the union of the section of the cornea, or to disturb the union, supposing it to have taken place previous to the influence of this medicine on the system. We have, therefore, to rely principally upon anti-phlogistic means to check the inflammation, until the cornea be sufficiently united to bear mercurial action. In consequence of this difficulty, iritis, after extraction, is a formidable disease ; and, very frequently, terminates in obliterating the pupil.

When the inflammation of the iris is primary, or when it is effected in consequence of disease extending to it from the sclerotic, after the operation of the extraction, the belladonna should be constantly employed to counteract, if possible, the tendency to contraction, and closure of the pupil.

When a case proceeds favorably after the operation, the section is generally adherent, and the chambers filled with aqueous fluid, in less than twenty-four hours. This I have had an opportunity of observing, several times, when the patients have undesignedly opened the eye, at the time I have been cleansing the palpebræ. I do not, however, deem it prudent purposely to expose the eye, at so early a period ; and should strongly recommend that no attempt be made to examine the eye, provided that it remain quiet, and free from pain indicating inflammation, until the expiration of forty-eight hours, at least ; and I think it better to wait the expiration of seventy-two hours, before this is done : no good can result from disturbing the eye within this time ; and much mischief may ensue, if the union of the cornea be but slight or imperfect. The reparative process is so various, in different individuals, that it is impossible to determine at what period the section of the cornea may be united ; and it is, therefore, best to allow the eye to be in a perfectly quiescent state, for a sufficient space of time, that the union may become firm, even though it be very tardy.

If, on examination, the union be found to be firm, the eye free from inflammation, and the pupil round and clear, the patient should not be allowed to exercise vision more than to satisfy

Union of the
cornea.

Exposure of
the eye.

him that his sight is restored. The eye should be again covered, and merely again exposed for a few minutes, each time that it is cleansed, until the expiration of a week ; after which, the ribbon or bandage may be laid aside ; but all bright light must be excluded from the room ; and the eyes be protected by a green or dark silk shade ; and the patient may begin to use the eye for ordinary purposes, as an aid in feeding or dressing himself ; but must not attempt to exert it for minute purposes, as reading or writing. By degrees, the quantity of light admitted into the chamber may be augmented ; and the shade removed at first toward evening, when the light is dull.

After the eye has, in this manner, become accustomed to light, and bears it without inconvenience ; and it has perfectly recovered from the effects of the operation, the patient may try the use of convex glasses. He will, usually, require two pairs : for the power of adapting the eye to view near and distinct objects has been destroyed ; and it is necessary that he should have a lens for near objects, and one, of longer focus, for distant objects.

Selection of
glasses.

The patient can usually distinguish large objects, or even distinguish features, without the aid of a glass ; and I have known persons who had been very short-sighted, previous to the for-

mation of the cataract, able to read a large print without any artificial aid, after the cataract had been removed. It is impossible to tell what should be the focus of the artificial lens, for any case. In making a selection, the patient should choose that which makes the object viewed distinct, without magnifying it.

If the glasses be selected, at too early a period after the operation, it is probable that the patient will find it necessary to have fresh ones, after a short time. I believe that the eye is some time before it becomes perfectly settled after the operation ; and until this has occurred its focus is not determined. I am induced to believe this, from having frequently known that glasses, selected at an early period after an operation, and which have enabled the patients to see distinctly, have, after a few weeks or months, become useless ; but, that glasses of different foci, have again made the vision perfect.

When a patient is provided with proper glasses, directions should be given to use them sparingly at first, especially those which enable the person to see minute objects.

A cataract glass should be of small size, not exceeding three quarters of an inch in diameter ; and should be mounted in a broad tortoise-shell, or dark rim ; by which means,

the spectacles are diminished in weight, and a limited quantity of light only is admitted to the eye ; and much confusion of vision is thus prevented.

OF THE OPERATION OF DEPRESSION.

THE operation of depression, like that of extrac- Cases for.
tion, is applicable to cases of hard cataract ; but
should, in my opinion, only be performed, when
the latter operation is impracticable or hazard-
ous,—namely, when the globe is very deeply
seated in the orbit ; when the palpebral aperture
is much contracted ; when the anterior chamber
is very small ; when adhesions exist between the
pupillary margin of the iris and the anterior cap-
sule of the lens ; when the globe has lost much
of its natural elasticity ; when the patient is ex-
tremely feeble ; or, when he is the subject of
chronic cough or asthma.

These circumstances have been fully detailed
in the description for the operation of extrac-
tion.

Before the performance of the operation, the Previous con-
patient should be brought, as near as possible, to siderations.
the same condition as that which I have de-
scribed to be necessary, previous to extraction.

Instruments.

In the performance of the operation, the surgeon will require a curved needle, as represented in *plate 9, fig. 7*; and he may, in some cases also, require the aid of the wire speculum. *Plate 9, fig. 14.*

Position of patient.

The patient should be seated on a low chair, so that the light may fall obliquely on the eye; and the surgeon should be seated immediately opposite the patient, but somewhat higher. The sitting posture is better than the recumbent in the operation, as it enables the surgeon more accurately to ascertain when the cataract is sufficiently depressed.

Pupil dilated.

The iris should be previously placed under the influence of belladonna, that a dilated pupil may afford the surgeon a good view of the deeper-seated humor, as he proceeds with the operation.

Duty of assistant.

An assistant should support the patient's head against his chest, and fix the superior lid either with the fingers, as in the operation of extraction, or with the wire speculum. This instrument may be used with advantage when the globe is very deeply-seated, or the palpebral aperture small, so that it is difficult to secure the lid with the finger; or the bulk of the finger occupies so much space, as to impede the view of

Application of the speculum.

the globe. The curved end of the speculum, best suited to the size of the palpebral aperture,

should be carefully passed between the superior lid and the globe, so as to raise the former and press it towards the supercilium ; and, if the patient have little control over the motion of the globe, the assistant may aid in fixing it, by pressing the instrument slightly upon its superior part.

The surgeon, then, holding the needle as he Operation. would a pencil, should rest the ring and little fingers on the patient's cheek, a little below the outer canthus, and introduce the point of the instrument through the conjunctiva, sclerotic, choroid, retina, and hyaloid membrane, into the vitreous humor, at a point a little below the transverse axis of the globe at the outer part ; and about a sixteenth of an inch from the junction of the cornea and sclerotic. The point of the instrument should be directed, at first, towards the centre of the vitreous body, with the convexity of the curve to the iris ; and, as soon as it has penetrated the tunics above mentioned, the instrument should be half turned, so that the convexity of the curve be directed upwards, the point consequently downwards ; the instrument should then be directed between the lens and iris, and the point carried in front of the lens, when it will become visible through the pupil ; it should then be turned upon the capsule a little above its centre.

By carrying the needle backwards, the lens should next be reclined or turned, its anterior surface being directed upwards ; the point of the instrument should then be liberated from the lens by slight rotation of the handle, between the finger and thumb ; and, when liberated, should be brought forward a little, and fixed again near the centre of this body. The next step should be to press the cataract, gently, downwards into the vitreous body, until it sink just below the lower margin of the pupil ; after which, it should be carried, by the needle, from the iris towards the posterior part of the globe ; but only to such an extent, as to prevent its pressing upon the iris, or ciliary processes. When this has been effected, the needle should be again rotated, freely, between the finger and thumb, to liberate its point from the cataract ; and the point should be cautiously raised, so as to be brought into the sphere of the pupil, in order that the surgeon may be satisfied that it is freed from the cataract ; and that the cataract remains depressed in the vitreous body ; if so, the needle should be carefully withdrawn. But if the cataract rise again with the needle, the same steps must be again pursued, until the cataract remains below the axis of vision. The different parts of the operation should be performed cautiously and slowly ; for, if done with rapidity,

the operation, according to my own observation, seldom succeeds.

The principal circumstances to be avoided in the operation are injury to the ciliary processes, and iris, and pressure of the lens upon either of these parts, or upon the retina. To enable the young surgeon to avoid these evils, I have been thus particular in describing the operation. Immediate dangers.

The needle should be introduced at a sufficient distance from the junction of the cornea, and sclerotic, to avoid the ciliary processes ; and from the transverse axis, to avoid the long ciliary artery. The lens should be reclined before it is depressed, to prevent the risk of its coming in contact with the retina ; and it should be carried backwards, to place it clear of the iris, and for the purpose of getting a portion of the vitreous body above it, to prevent the liability of its rising again. Of course it is important not to depress it too far, for fear of its coming in contact with the retina. How obviated.

If the operation succeed, the restoration of vision is immediate ; but it is highly imprudent to allow the patient to exercise it. The eye should be covered with linen and bandage, as after the operation for extraction ; and, for a few days, should be treated the same, in every respect. After three or four days, the bandages may be removed, and the eye exposed to a moderate After treatment.

degree of light, protected by a shade ; and, after a few days more, the eye may be fully exposed, and the patient may be allowed to use it, for all ordinary purposes.

Use of glasses.

A month or more should elapse before glasses are tried, which the patient may then use, with the same precautions as if he had undergone the operation for extraction.

Subsequent dangers.

Inflammation of the iris, or of the retina, may result from the operation of depression ; and when it does occur, it is generally fatal to vision ; being produced by pressure of the cataract, and not yielding to the usual remedies ; for the cataract acts as an extraneous body ; and as long as it continues to irritate, so long the inflammation continues ; it may be mitigated, but seldom subsides altogether, until disorganization has taken place.

Inflammation of the iris may arise from injury by the needle, during the operation ; in which case it will be readily subdued, by slight depletion and the influence of mercury, which may, in this instance, be safely employed. When inflammation arises, either in the iris or retina, prompt measures should be adopted to check it ; for, although, in the majority of cases, it leads to most unfavorable results, yet, now and then, it disappears under active treatment, and the patient recovers vision. The treatment should be

as directed in the idiopathic forms of these diseases.

Sometimes, at a remote period from the operation, the cataract will rise from the vitreous humor, and re-assume, somewhat, its original position, and again obscure vision: or, by its position in the vitreous humor being otherwise changed, it may come in contact with the iris, or retina, and produce the inflammatory affections before described. The operation of depression, therefore, although it restore vision at the time, is attended with the risk of subsequent mischief, which cannot result from the operation of extraction.

Cataract rises
again.

The cataract when depressed, even without its capsule, will sometimes rest for years immersed in the vitreous fluid, without much change; but when the capsule remains entire, scarcely any change is perceptible. Whilst it remains, it is always liable to the displacements before alluded to, from any sudden and violent exertion, as coughing, sneezing, &c.

The result of the operation of depression has not, under my observation, been so successful as extraction; for which reason I adopt the latter, when the case admits of it, in preference to the former.

OF THE OPERATION FOR SOLUTION.

THE object of this operation is to submit the cataract to the influence of the aqueous humor, which has the property of dissolving it.

Not applicable
to hard
cataract.

The operation is scarcely applicable to the cases of hard cataract in elderly persons ; because the process of solution is so extremely slow, that many months, or even years, elapse before it is completed ; and when the capsule has been opened, and solution has in great measure destroyed the connections between the capsule and the cataract, there is great danger of the hard opaque portion that remains being dislocated, and pressing upon the iris, so as to create destructive inflammation.

Applicable to
soft cataract.

If the cataract have not a consistence much greater than that of the natural lens, this operation, when carefully conducted, seldom fails to produce restoration of vision : but if it be roughly performed, or the surgeon attempt to effect too much at once, it is more hazardous than the operation of extraction.

The danger is twofold,—first, from injury to the iris or ciliary processes, during the operation;—secondly, from the pressure upon the iris, by fragments of the cataract, or of the larger part of its body displaced, at the time of the operation, or subsequent to it; for, if the capsule have been extensively lacerated, and the lens much disturbed by the needle, although there be no dislocation of the cataract itself, or of any fragments, at the time, yet during the progress of the solution, large fragments may be separated, or the mass itself may be displaced, so as to rest and press upon the iris, and induce inflammation of great severity, likely to destroy vision.

It is true that solution goes on most rapidly when the cataract has been divided into small portions, and placed in the anterior chamber, provided that inflammation do not take place; but if this be done, (except in the cases I shall presently mention,) I am satisfied that, out of every three or four cases, one would terminate in loss of vision.

If the cataract itself, or any fragments of it, lodge upon the iris, and produce inflammation, the usual remedies, depletory or mercurial, although they may check its violence, will not subdue it altogether, so long as the pressure continues; the surgeon, therefore, is compelled

to resort to the operation of extraction to remove the irritating body ; a measure not only extremely painful, during the existence of inflammation, but also very hazardous.

The principle of the operation must be the same in all cases ; but by a careful modification of it, the surgeon may prevent the evils just described, and will rarely fail to produce a successful result.

In some instances, the cataract, or its remains, may be freely cut up or divided into small portions, which may be placed in the anterior chamber, or left posterior to the iris. In other cases, it may be desirable merely to make a small opening in the anterior capsule of the lens, without much disturbing the lens, or destroying its connection with the capsule ; and, further, I think it advantageous, sometimes, merely to perforate the capsule and lens with a fine needle, only effecting an aperture equal to the diameter of the needle.

Previous to the performance of the operation for solution, the patient should be brought, as near as possible, to that condition of health which I have described as favorable to the operation of extraction. The iris should be placed under the influence of belladonna, so that the pupil be fully dilated at the time of the operation.

When the surgeon wishes to lacerate the an-

terior capsule of the lens, or simply to puncture it, it is best to pass the needle through the cornea, anterior to the iris. If he intend to divide the lens into small pieces, he will best effect this, by introducing the needle through the sclerotic, &c., behind the iris. The former is termed the anterior, the latter the posterior, needle operation, which I shall now proceed to describe.

OF THE ANTERIOR OPERATION.

- Synonyme. THIS is called the operation of *Keratonixis*, as being performed through the cornea.
- Instruments. The instruments required in this operation are a straight needle, merely pointed to make it penetrate with facility, but without cutting edges; (*see plate 9, fig. 5*;) and the wire speculum.
- Cases for. In cases of soft lenticular cataract, whether congenital, idiopathic, or traumatic, unaccompanied by any other disease, after the period of infancy, I consider it best to adopt the following plan of operation.
- Operation. The patient should be recumbent, the light should fall obliquely upon the face, and the surgeon should be seated with his breast against the head of the patient; the superior lid should be raised and fixed by the fingers, as in the operation of extraction; or by the wire speculum; the inferior lid should be depressed by the finger of an assistant. In managing the superior

lid, the surgeon must employ the left hand, if he have to operate on the right eye; and the right hand, if he have to operate on the left eye.

The needle should be held by the hand not occupied in fixing the superior lid, in the same manner as in the operation for depression; and the point should be introduced through the cornea, near its junction with the sclerotic at the temporal side, one flat surface being opposed to the iris; it should be carried on in the anterior chamber through the pupil, and directed to the capsule of the lens near to the upper part of the pupillary margin of the iris, where it should be made to penetrate the capsule; it should then be directed downwards, so as to lacerate the capsule perpendicularly—the laceration terminating near the lower border of the pupillary margin. In doing this, the surgeon should be careful to disturb the lens as little as possible; and should withdraw the needle immediately the laceration is effected.

Belladonna should be applied to the eyebrow; and the eye should be covered by a light compress of dry linen, which should be secured by a bandage. The eye should be cleansed with tepid water, every six or seven hours; and fresh belladonna should be placed upon the eyebrow, night and morning. The patient should be kept upon

abstemious diet ; and the secretions should be carefully attended to.

When the consistence of the cataract is less than that of the natural lens, a part of it sometimes protrudes through the opening of the capsule, immediately it is effected.

The operation is momentary, and is scarcely felt by the patient. The progress of solution, after this operation, is usually slow. The surgeon must watch carefully, and if he find that little alteration is going on, he should repeat the operation. I generally find it necessary to do so in five or six weeks, and sometimes earlier. The progress of the solution can be ascertained by the increase in the size of the anterior chamber ; for, as the lens diminishes, the iris in a measure recedes. This is readily seen by viewing the eye in profile.

If the lens be very soft or fluid, a portion or the entire contents of the capsule escapes when the laceration is effected ; and the aqueous humor becomes cloudy from the admixture of the opake fluid ; or loaded with small flocculi of the soft matter.

Produces
vomiting.

I have observed a curious circumstance consequent upon the operation, in many of these cases ; and constant, with one exception, when the cataract has been fluid : it is, that excessive irrita-

bility of the stomach has come on within a few minutes, or an hour after the operation, producing vomiting, sometimes very violent; and I have known it continue, almost without interruption, for forty-eight hours; more frequently it subsides in the course of two or three hours. There has not been local inflammation of any importance in any of these cases.

OF THE POSTERIOR OPERATION.

THE term *Hyalonixis* has been applied to this Synonyme. operation by some surgeons, because the instrument penetrates the hyaloid membrane.

In the performance of the operation, the sur- Instruments. geon will require a straight needle which will cut with its edges to the extent of about an eighth of an inch from the shoulder; (*see plate 9, fig. 6;*) and the wire speculum.

I consider this operation applicable, principal- Cases for. ly, to cases of congenital lenticular cataract, provided it be performed before the patient have passed the age of two or three years; and it may also be adopted in cases of soft lenticular cataract, at a more advanced period of life, when but a small portion of the lens remains: for instance, when the largest part of the cataract has been

removed by solution, in situ, after the anterior operation ; or when the disease has resulted from a wound, and but a small portion of lens remains ; but I should not advise its adoption for the removal of the entire cataract after the period of infancy, for the reasons previously given. It is after ample experience that I recommend the operation in the infant, the subject of perfect congenital cataract ; never having had a case in which any untoward symptom has followed its performance ; and it secures this great advantage, namely, that the one operation suffices to effect a cure. In many cases of congenital cataract, I have performed this operation only upon one eye ; and, in the other, merely divided the lens without displacing it : the result of this proceeding was a rapid solution of the cataract, after the former operation ; but a necessity for a repetition of operation, after the second : in no instance was there an exception to this.

Operation
upon an infant.

In submitting an infant to this operation, it is necessary to employ several assistants. The child should be laid upon its back, on a pillow ; one assistant should confine the arms to the side, and fix the upper part of the trunk ; a second should place his hands so as to embrace the head and face laterally, to fix the head. The light should fall obliquely upon the child's face ; and

the surgeon should be seated so that the child's head rest against his breast ; the wire speculum should be introduced beneath the superior lid, and the lid be raised and fixed by it.

The needle should be held as a pen, in the hand not occupied by the speculum ; and should be introduced as in the operation for depression, a little above or below the transverse axis of the globe, at the outer part, about the sixteenth of an inch from the junction of the cornea, and sclerotic, to avoid the long ciliary artery, and the ciliary processes. It should be directed through the conjunctiva, sclerotic, choroid, retina, and hyaloid membrane, towards the centre of the vitreous body ; but, as soon as it has penetrated the tunics, the point should be directed between the iris and lens, with one flat surface of the instrument towards the former, until it has nearly reached the opposite side of the pupil ; when one of the cutting edges should be turned upon the cataract, for the purpose of dividing it ; which should be done, by retracting the needle, and pressing it, at the same time, against the opaque mass ; by again pushing forward the needle, and again retracting it in the same manner, but in different directions, the whole of the cataract should be divided into small portions ; which should afterwards be propelled through the pupil

into the anterior chamber, by the needle. The instrument should then be withdrawn.

The after treatment should be the same as that directed for the anterior operation.

Operation for
opaque capsule.

The posterior needle operation should be also resorted to, in cases of capsular cataract, when the lens has been removed either by extraction, or solution, resulting from operation or accident. Such cases are of frequent occurrence, sometimes as the immediate consequence of operation, or injury ; but occasionally produced by inflammation, at a period remote from the removal of the lens.

Capsule not
absorbed.

It is at present a question whether the opaque capsule undergoes solution, or not ; my own opinion is, that it does not ; and I beg to state a few reasons which have brought me to this conclusion ; I was first led to reflect upon the subject, and to make enquiries respecting it, in consequence of seeing the eyes of a girl upon whom Mr. Saunders had operated for congenital cataract. The cataracts were, in a great measure, capsular, and Mr. Saunders had effected an aperture in the opaque mass, in each eye, by cutting out small fragments of the capsule with a fine cutting needle. Many of these fragments fell into the anterior chamber ; and at the present

time, upwards of twenty years subsequent to the operation, they still remain. (*See plate 6, fig. 2.*) The eyes of this patient are delineated in one of the plates of Mr. Saunders's posthumous work. Now, these fragments were originally placed, and have continued, in the position considered by all surgeons most favorable for solution; but they have not become dissolved. Again, if opake capsule were acted upon by the aqueous humor, it must, in the course of time disappear; whereas I have known very many instances, beside that mentioned, in which portions of this membrane, although submitted to the influence of the aqueous humor, have for years remained the same. Further, if the aqueous humor can act upon the opake capsule, why do we not occasionally find such form of cataract to disappear, without an operation? We never do so. The circumstance which has given rise to the opinion, that the capsule, when opake, becomes dissolved, I believe to be the gradual diminution of the substance, after the use of the needle. This is, however, nothing more than a contraction.

Suppose that a portion of opake capsule be stretched across the pupil from side to side, consequent upon some injury or operation which has destroyed the lens, such portion of capsule may remain for years without any alteration, unless it be divided or detached by a needle, when it im-

mediately begins to contract, and, eventually, shrinks into a very small compass. I have frequently divided or detached such portions, after they have existed for months or years, without change, and have had ample opportunity of watching the contraction. As the membrane becomes apparently less and less, its density increases: if, for example, whilst stretched across the pupil, it presented the appearance of an extremely delicate web, after being detached, the delicate appearance is lost, in proportion as the diameter of the body decreases; much as the delicate texture of the spider's web is seen when it is stretched out, but becomes destroyed when it is detached, and folded in mass. If the opaque capsule underwent solution simply, it would be rendered more delicate as it diminished, instead of becoming more dense.

Before resorting to operation for removal of opaque capsule, it is advantageous to ascertain, as far as possible, its extent, its attachments, and its firmness; which may be, in great measure, accomplished by careful examination when the iris is fully under the influence of belladonna. The extent of the opaque membrane may be equal to that it naturally occupies; or it may merely occupy the aperture of the pupil, being adherent to the iris at its circumference; it may have a fine gauze-like appearance; or possess a density

equal to that of thick white paper. When it has merely its natural attachments, or when it is of thin and delicate appearance, it may be easily detached or divided ; but if it be adherent to the pupillary margin of the iris, and be very opaque, it is usually tough, and is difficult to be detached or divided.

When capsular cataract occupies the entire pupil, and exhibits a delicate structure, it is best to make an aperture in it, corresponding to the centre of the pupil ; which can be readily done with a fine cutting needle, used as in the anterior or posterior operation already described. When the membrane is dense and tough, but not adherent to the iris, the surgeon may either make a central aperture in it, by cutting away part with a fine needle ; or he may detach it from its ordinary connections, and depress it, or twist it so as to remove it, entirely or partially, from the axis of vision. It is very difficult, in most cases, and impossible, in some, to depress the capsule ; for, its specific gravity being less than that of the vitreous body, it rises again, as soon as the force used in depressing it is withdrawn. I have found, in these cases, that I can more readily restore vision by twisting the membrane into a small compass, than by depressing it.

The twisting of the capsule, I accomplish by

means of a curved needle, curved rather more than Scarpa's. This instrument I introduce, as in the posterior operation, and cause it to penetrate the opaque capsule, near to the outer side of the pupil from behind to before; and again near the inner side of the pupil from before to behind. I then rotate the needle between my finger and thumb, by which movement the capsule is twisted round the extremity of the instrument, and detached from its connection, and can be carried out of the axis of vision, as the needle is withdrawn from the eye. Or, if the capsule be not very tough, it readily lacerates when the instrument is rotated, and a central aperture is then easily effected. This mode of operating is more especially advisable when the capsule is adherent to the iris; as the adhesions are separated more readily, and with less violence, than by using a straight needle. I have seen so much force employed with the straight needle, when a surgeon has been endeavouring to separate a dense opaque capsule from the iris, that the iris has been separated from the ciliary ligaments; or that it has been forced back so far, as nearly to be brought into contact with the retina.

By careful management, I believe that the surgeon can restore vision, in all the cases in which it is obscured by opaque capsule only; and that he may effect this with the needle. The

attempt to remove an opaque capsule by extraction I consider imprudent, in most cases, as attended with great risk; especially when the opaque capsule is firmly adherent, as is frequently the case. I have seen it done, with little difficulty or suffering; but I have, more frequently, seen the attempt fail; and, in some instances, it has proved fatal to vision.

A neat and delicate little instrument has been made, by directions of my colleague, Mr. J. Dalrymple, by which a portion of opaque capsule may be extracted with less risk, than by the hook.

OF THE OPERATION OF DRILLING.

Cases
proper for.

THERE are many cases, in which capsular or capsulo-lenticular cataract is produced, by the extension of inflammation from the iris to the capsule ; as I have explained. *Vide Inflammation of the Iris.*

Not fit for
extraction.

IN such cases, the operation of extraction ought not to be attempted ; because the adhesions between the iris and anterior part of the capsule of the lens, make it extremely difficult to get out the lens, after the section of the cornea is made : it cannot be accomplished without much violence ; and, when effected, is most likely to excite deep seated inflammation, which would be fatal to the organ : such has been the unfortunate result of the operation of extraction, in nearly all cases of this kind in which I have known it to be performed.

SOME years since, the practice at the Ophthalmic Hospital, in the treatment of these cases, was to divide the iris and lens at the same

time, by Maunoir's scissors, so as to form an artificial pupil, and expose the lens to the influence of the aqueous fluid : the operation was performed as I shall hereafter describe. (*Vide Artificial Pupil : Maunoir's Operation.*) The result of this practice was, however, so very unsuccessful, that I dreaded to undertake it ; and, by careful observation, I had good reason to suspect, that a great deal of the mischief which followed the operation, and proved fatal to the eye, resulted from the pressure and irritation produced by the divided portions of the crystal-line lens, which were usually displaced by the operation.

After much careful consideration of the subject, I felt satisfied, that a much better result might be obtained, by a modification of Mr. Saunders's operation for solution, by which the lens might be got rid of ; and that, subsequently, Maunoir's operation might be performed with much less risk.

The plan I adopted, and have since continued, is as follows :

The patient being placed as if to undergo the anterior operation for solution, I have passed a very fine straight needle through the cornea at the outer part ; and then, directing the point to the anterior capsule of the lens close to the inner margin of the pupil, (taking care not to

Mode of
operating.

injure the iris,) and causing the instrument to penetrate the capsule, and enter the substance of the lens to the extent of about one-sixteenth of an inch, I have rotated the handle of the needle between the fore-finger and thumb, so as to make the point act as a drill ; and have thus secured an opening more free than could be effected by a simple puncture ; then I have withdrawn the needle.

By using a very fine straight needle, of uniform thickness, and by introducing it a little obliquely through the cornea, I have frequently performed this operation, without the loss of a single drop of aqueous humor ; and I have rarely found it produce any inflammation.

Repetition of.

According to the degree of absorption or solution, I have usually repeated this operation, every three, four, or five weeks ; and have been careful to puncture the opaque capsule in a fresh place, at each operation : and this has generally enabled me so far to weaken or detach the portion of the capsule, occupying the site of the pupil, that it has been easily displaced, when the lens has become dissolved.

Signs of
absorption.

The extent of the loss of lens may be ascertained by two means :—first, the increase in size in the anterior chamber ;—secondly, by the resistance offered to the point of the needle ; for as long as much of the lens remains, the ope-

rator may feel resistance to the point of the instrument; whereas, the capsule alone can hardly be felt.

I think, upon the average, that I have had to repeat the operation seven or eight times, before I have been satisfied that the lens has been removed: consequently, the cure has been extremely tedious; but as the plan incurs very little risk, and does not confine the patient for more than two or three days, after each operation, there can be no further objection to it than the slowness of its effects, which is more than counterbalanced by the success of the treatment.

I have operated upon a considerable number of these cases, by drilling; and have good reason to be satisfied with the result of the operation; in no instance has it produced inflammation of importance; and, out of the few cases in which it has failed to restore vision, I believe that the sensibility of the retina had been previously and permanently injured; for I succeeded in getting rid of the cataract, and in clearing the pupil to a sufficient extent to afford good vision, provided that the retina had retained sufficient power. It is impossible to decide upon the condition of the retina, before operation; excepting so far as regards perception of light, without which the treatment should not be adopted.

The operation is adapted to all cases of this

class, both in young and old persons ; for I believe, generally, that the lens is not opaque, but retains its ordinary consistence ; and even when it is opaque in elderly persons, in connection with, and in consequence of the disease in the capsule, that it has not the hard character of the ordinary cataract.

In most of these cases which I have operated upon, by drilling, I have been able to effect all I could desire by the fine needle only ; but, in a few instances, I have been obliged, eventually, to make an artificial pupil, by Maunoir's plan of operating ; being unable to clear a sufficient space, in the natural pupil, to afford useful vision ; and these operations, for artificial pupil, have been generally successful ; proving that I had formed a correct opinion of the principal cause of failure, in the cases submitted to Maunoir's operation, whilst the lens remained.

I cannot better evince the value of this modified plan of operating with the needle, than by the detail of a few cases.

Case.

133. I admitted a sailor, aged sixty-three years, into St. Thomas's Hospital ; he had entirely lost the right eye, the globe being shrunk ; in the left, all useful vision was destroyed ; the pupil being contracted to a very small size, and occupied by a dense white membrane, to which the pupillary margin of the iris was adherent ;

he had suffered from acute inflammation of the iris; and a slight chronic form of the disease existed at the time of his admission into the house: the patient could distinguish light with the left eye; and when the organ was directed to a bright light, he could discern several dark *muscæ* which appeared to move. There was good reason to suppose, that the disease of the eye was connected with specific taint.

I placed the man under a mild alterative course of treatment; he took small doses of mercury with chalk, and extract of hemlock, and sarsaparilla; his diet was good and nutritious, and he was kept quiet: in a few weeks, all evidence of local inflammation had disappeared; the *muscæ* had vanished, and his health was much improved; but I continued the alterative treatment for rather more than three months; and then performed the first operation of drilling the capsule and lens. In a period of five months, I had repeated the operation six times, and was satisfied that the lens had been absorbed; yet the pupil was still occupied by opaque capsule, which I could not detach or separate, with moderate force; and, I therefore, divided the iris in part, by Maunoir's scissors, and formed a good artificial pupil of elliptical figure, and the patient enjoyed good vision by the aid of convex glasses.

Throughout the treatment of this case, the patient remained free from all irritation and inflammation in the eye.

Case.

134. In the year 1836, a young woman, aged nineteen, was brought to the London Ophthalmic Hospital, having lost the right eye, which had been disorganized by deep-seated inflammation; and possessing only the power of perceiving a bright light with the left; the pupil of this eye was much contracted, very irregular, and the margin of the iris was adherent to the anterior capsule of the lens; the capsule itself was opake and thickened, or covered with an opake deposit; the iris was rather dull, and also appeared thickened. The mother of the patient stated, that all the changes which I have noted as existing in the two eyes, had occurred before the girl was two years of age; and that she had not been able to distinguish more than light from darkness, since that period.

The general health of the patient had been good, and all the principal functions were regularly performed; but her aspect evinced a scrofulous diathesis. As she could distinctly tell when any opake body was passed before her left eye when exposed to a good light, I considered the case might be benefitted by medical and surgical treatment. I directed, therefore, a mild alterative course, consisting of very small

doses of mercury with chalk, and sarsaparilla, with a careful, plain, but good diet; and this was pursued through a period of some months.

During the course, the young woman became more robust and healthy in her appearance, and the iris assumed a brighter aspect, and its blue color became deeper and more brilliant. In June, 1837, I performed the first operation of drilling, and repeated it several times before the end of October, without the occurrence of any unfavorable symptom; through the winter, I saw her occasionally, and merely ordered medicines to regulate her health. In the spring of 1838, I again performed the operation of drilling, and repeated it a few times, previous to the month of June, when a large part of the pupil became clear, from the falling of a piece of opaque capsule which I had succeeded in detaching by the needle, in nine operations which I had performed in the course of the year, from June 1837, to June 1838.

The extent of vision, immediately obtained by the patient, much exceeded what I expected; for I was apprehensive that the retina would possess but little power, having been so many years deprived, in great measure, of its stimulus: the young woman was soon able to distinguish objects of moderate size, and speedily learnt to recognize persons, and to guide herself; but for

many months was unable to judge accurately of distance ; she now has accurate vision, and it is of sufficient extent to enable her to distinguish the large letters in the title-page of a common octavo book : within the last two or three months an evident improvement has taken place in her sight, and, I believe, that it will, in time, become much more perfect, than it now is.

As this young woman became blind at a period in which she could hardly appreciate the value of the sense, and had lost all recollection of it, the restoration of vision by operation, &c., was equivalent to giving her a new sense, of which she has scarcely yet found the extent, and importance.

Case.

135. A case of very similar character to that just detailed, has been under my care, in St. Thomas's Hospital : the patient was a stout but scrofulous young woman, eighteen years of age, who had lost vision from inflammation affecting the iris and choroid, and extending from the former to the capsule of the lens. The patient being deficient in intellect, and powerful, I had much difficulty in performing the operation.

I submitted her, first, to a mild alterative course, for nearly three months, and then commenced the process of drilling : altogether the operation was repeated seven times ; and, subsequently, I detached the capsule in part from the

connection with the iris, by using a curved needle posterior to the iris ; and since then, the capsule has shrunk, and left a large part of the pupil clear, by which the young woman has obtained vision, within the last two months ; at present she sees objects of moderate size, very readily.

136. A lady, above thirty years of age, of dark Case. complexion, and having naturally rather feeble power, became subject to inflammation of the choroid and iris, in the left eye, which extended to the capsule of the lens, and produced extensive adhesions, between the pupillary margin of the iris, and the anterior capsule of the lens, and rendered the latter opake ; so that the patient lost all but the perception of light. Shortly after the disease had disturbed the vision of the left eye, it attacked the right, and advanced so far as to occasion capsular cataract in it, though much less dense than in the left ; so that a more distinct perception of light remained.

The treatment pursued, during the continuance of inflammatory action in the eyes, had been principally anti-phlogistic or depletory, and mercurial ; and her general health had suffered considerably, from its effects.

When the inflammation was subdued, this lady went into the country ; and, after a stay of several weeks, returned to town much improved in

health, but with no change in the vision ; the eyes remained perfectly quiet.

She was then advised to submit to the operation of extraction of the lens from the right or best eye ; the operation was performed, I believe, very skilfully, but deep seated inflammation ensued ; and, after much suffering, the eye became perfectly disorganized ; and her health again greatly disordered by the suffering, and the effects of the severe treatment which had been adopted, with a view to arrest the inflammatory action.

When the lady was recovering from the effects of this operation, I first saw her ; being consulted, principally, respecting the propriety of attempting the operation of extraction, on the left eye. I stated my objections to the operation of extraction, in such a case ; and pointed out the advantages of the cautious use of the needle, as employed in the preceding cases ; but recommended that the general health should be much improved, and a very careful alterative plan of medical treatment be instituted, before the patient was submitted to any kind of operation.

I did not see the lady again for several months ; and being then requested to visit her, I found her much improved in health and strength ; with the right eye shrunk but quiet, and the left in

the same state as when I before examined it. She was now anxious for me to undertake the treatment of the left eye, by the needle; but finding that she was troubled by dark muscæ in the left eye, when opposed to a strong light, I first proposed a few weeks' alterative treatment, which had not been previously adopted.

A few weeks after the patient had begun the alterative plan, I commenced my operations; the first use of the needle, as a drill, was followed by the escape of a small portion of cream-like fluid from the capsule of the lens, which mixed with the aqueous humor, and gave rise to much irritability of stomach, so as to occasion severe sickness, which was continued through two or three days. Between April and October, I performed four operations; three for drilling, and one to detach the opake capsule, in great part, from the iris: the alterative treatment was continued through the whole period, and contributed much to the improvement of her health.

The recovery of vision, in this case, is perfect; as the patient can with a cataract glass see to read a minute print; one musca still remains, of a dark and defined character, but it does not interfere with vision; occasionally, other small grey muscæ appear, when the lady has gastric derangement.

At the time I took the management of the

case, the vision of the left eye had been lost for seven years ; it is therefore remarkable, that the recovery of sight is so perfect.

The removal of the lens was unusually rapid, and resulted from the change in its consistence ; for it was so soft, that I could hardly feel any resistance to the needle in the operation of drilling.

The foregoing cases, are, I consider, sufficient to prove the efficacy and advantage of the operation of drilling ; they contain, however, but a very small portion of my experience of it, and I have not yet met with any thing that should induce me to do otherwise than strongly to recommend it as the means best calculated to restore sight. in the class of cases which I have described.

OF THE COMBINED OPERATIONS OF SOLUTION
AND EXTRACTION ; OR OF SOLUTION AND
DEPRESSION.

THERE are occasionally cases of cataract in which the bulk of the diseased body is principally hard, for which the operation of extraction cannot be safely adopted ; because the cataract is so large as to press forward the iris, and render the anterior chamber too small to allow of the passage of the knife, to make the section of the cornea ; but in which no other circumstances would forbid the operation.

In such cases, I have first performed the anterior operation for solution, making a very small central opening in the anterior capsule of the lens, the pupil having been previously dilated by belladonna.

After this operation, I have had the patient kept quiet, and under careful observation for a few weeks ; the diet being moderate, and the pupil being constantly dilated by the use of belladonna ; and as soon as the bulk of the lens

has been reduced, by solution of the outer soft matter, so far as to allow the iris to recede, and augment the size of the anterior chamber, sufficiently to permit the passage of the extracting knife, I have performed the operation of extraction : this I have been able to do, between four and six weeks after the needle operation, according to the progress of absorption of the soft portion of the cataract.

Success has resulted, in every case, in which I have adopted the two operations.

When performing the operation of extraction, after the anterior needle operation has been effected, the operator should bear in mind that the anterior capsule of the lens is open, and he should therefore be very cautious in completing the section of the cornea, to remove all pressure on the globe, and not to make sudden motion with the knife ; or the lens, with part of the vitreous humor, will easily escape through the section.

In cases in which I could have extracted at once, I have also tried this double plan of operating, in order to ascertain the effect in ordinary cases : and I have been so much satisfied with the result of such trials, that I am induced to recommend the application of the two operations to those who have but little opportunity of operating upon the eye.

The operation of extraction is, in my opinion, one of the most difficult in surgery, and one which requires much experience, to perform it with confidence, and certainty: the principal difficulty consists in making the section of the cornea without injury to the iris; and this difficulty is considerably lessened, when the anterior chamber is large; and, further, the difficulty is great, in proportion to the extent of the section.

By the operation of solution, these difficulties can, in most cases, be much lessened; for, in nearly every instance, the exterior of the cataract is so soft as to be readily acted upon by the aqueous fluid; and, in consequence, the operation of solution usually effects a considerable diminution in the bulk of the cataract: as this diminution of the lens takes place, the space of the anterior chamber gradually augments—for the iris recedes as solution goes on: further, as the lens is thus much reduced in size, it is unnecessary to make so large a section of the cornea, when the surgeon wants to extract the remaining portion of the cataract.

When a patient can be carefully watched and attended to after the needle operation, I believe that little risk will result from treating the case by the double operation; but unless the patient be very quiet and cautious, some portions of the cataract may escape from the capsule into the

anterior chamber, and induce inflammation ; from the effects of which, changes may occur, which would prevent the attempt to extract afterwards ; or the lens itself may be dislocated, and by pressure on the iris, occasion severe and destructive inflammation ; but I believe the risk of these accidents to be much less, than would result from the attempt to extract at once, by an inexperienced hand.

In those cases, in which other circumstances altogether forbid an attempt to perform the operation of extraction, the operation of solution may frequently be effected, previous to depression of the cataract, with much advantage ; as it materially lessens the bulk of the body to be depressed ; or depression may be adopted, in the ordinary cases, in which extraction might be performed, after the solution of the soft part of the cataract, when the surgeon has not experience, or confidence, sufficient to perform the operation of extraction.

REMARKS ON THE OPERATIONS FOR
CATARACT.

IN connection with the description of each operation, I have stated the particular kind of cases to which I consider the operation best suited ; and I have done this with the confidence which a long and extensive experience warrants.

The operation of extraction which is best adapted to a very large proportion of the cases of hard cataract, is so difficult of performance, and requires so much experience in ophthalmic operations, besides an unusual extent of manual dexterity, that very few can perform it well, and with confidence.

I would entreat those who have but little opportunity of operating upon the eye, not to attempt extraction of a cataract, unless under the modification I have mentioned, in combination with solution : and I think such surgeons would do better still, by attempting to depress, than extract, after the soft part of a cataract has been

removed by solution : if well acquainted with the structure of the eye, the surgeon may readily avoid doing any serious mischief to the organ, in attempting to depress a cataract ; but he cannot do so in the operation of extraction, when so much depends on manual dexterity and experience.

If we were to judge of the comparative merits of the two operations of extraction and depression by their immediate results, we should, probably, decide that depression was more successful ; but when we look to the ultimate effects of each, I am satisfied that our decision would be in favor of extraction—supposing each mode of operating to be conducted by able and experienced surgeons.

The operation of depression inflicts more injury upon the organ, than the operation of extraction when well performed ; and its effects upon the eye are such, as to forbid an operation for extraction, should the depression not succeed ; for the hyaloid membrane is so extensively ruptured, that the fluid would escape in such quantity, through a section of the cornea of sufficient size to extract a cataract, that the organ would be lost.

When inflammation arises immediately, or soon after the operation of depression, it can rarely be checked so as to preserve the sight ;

for it is generally produced by the irritation of the dislocated lens, or cataract ; and attacks the retina, choroid, iris, &c. ; and in most cases, disorganizes the eye : and, in some instances, the patients suffer for months or years, after amaurosis is complete, from continuance, or relapse of deep seated inflammation.

Such mischief is not, however, immediate only, but more frequently takes place weeks, months, or years, after the operation ; in fact, at any time that the hard lens may have its position changed, so as to press against the iris or retina : occasionally, also, at a distant period from the operation, the opaque lens rises again to its original position ; or so far so, as to occupy the pupil, and obstruct vision.

None of these evils are consequent upon the operation of extraction.

Several high authorities, in ophthalmic surgery, strongly recommend the operation of depression, in preference to that of extraction : I am, however, uncharitable enough to believe, that many have found the operation of extraction too difficult for them.

The operation for solution is not suited to cases of hard cataract, excepting to the extent I have described : months, and even years may elapse before the aqueous humor completely dissolves the hard mass ; and, independent of

the tedium of the cure, there is constant liability to displacement of the indurated centre, as soon as the softer circumference has become removed ; and then extraction must be performed at great risk, or destructive deep seated inflammation will ensue, and the eye become disorganized. I have seen many such unfortunate terminations to cases of hard cataract, treated by the operation of solution ; and several in patients operated upon by an oculist, who unblushingly states that his operation is nearly infallible, in all cases of cataract : ought not such false statements to be publicly exposed ?

When the consistence of cataract does not exceed that of the natural lens, the operation with the needle, for solution, is, indeed, almost infallible ; provided that no other disease exist in the eye, and that the operations be cautiously conducted. I frequently see cases, in which the operation has failed ; and am satisfied that the failure, generally, results from doing too much at once ; or using the needle too freely : the free use of the instrument promotes a more rapid cure, provided that inflammation do not follow ; and the young operator, observing this, is very often induced to do more and more, until he is checked by the unfavorable termination of several cases.

I well recollect performing this operation, and

endeavouring to divide the cataract freely, believing that I was thereby expediting the cure ; but experience soon taught me that the advantage gained, in some cases, was more than counterbalanced, by the frequent occurrence of inflammation, and by the increase of the number of cases of failure. In fact, the more experience I have had, the more cautious have I become.

The modification of the operation which I have denominated *drilling*, I have adopted in the most unfavorable class of cataractous diseases, and with excellent success : and the result affords the best evidence of the good effects of the cautious use of the needle.

I have omitted to mention, that capsular cataract sometimes occurs after the operation of extraction, usually in consequence of inflammation which affects the iris : most frequently this is an immediate consequence of the operation ; but, occasionally, it does not occur till months, or even years after extraction : when it does take place, it is easily remedied by a needle operation.

OF CATARACT FROM INJURY.

Synonyme. . TRAUMATIC cataract.

Symptoms. As of ordinary cataract, when complete ; for in consequence of the irritation of the organ, from the injury, and the rapidity with which the lens becomes opaque, the patient is rarely aware of any gradual obscurity of vision.

Appearances. Besides the evidences of injury to the cornea, or sclerotic, iris, &c., the lens has a grey or white appearance, generally uniform, and glistening ; presenting the characters which I have described as indicating soft lenticular cataract.

Causes. Generally, penetrating wounds of the globe, which may injure the cornea only, besides the lens ; or the cornea, and iris ; or the sclerotic, and iris ; or the cornea, sclerotic, and iris ; and the extent and complication of mischief to the tunics, of course, much affects the result of the case.

Cataract, also, occasionally follows violence to the organ, which does not occasion breach of texture ; but, in such cases, the patients are

usually amaurotic, the retina being paralysed by the blow which causes the cataract.

Having described the treatment which should Treatment. be adopted in injuries to the cornea, sclerotic, iris, &c., I shall now confine my observations to the cataract.

Besides the treatment requisite for the injury to the tunics, the pupil should be kept constantly under the influence of belladonna ; and thus, whilst inflammation is prevented or subdued, the lens is submitted to the aqueous fluid, and becomes dissolved : if the belladonna be not employed, it sometimes happens that the iris becomes adherent to the anterior capsule at the site of injury, and closes the opening made by the wound ; so that the aqueous humor has not access to the lens, and the process of solution cannot go on.

In most cases, however, the cataract gradually disappears, without surgical aid ; and no doubt the frequent observation of this fact gave rise to the operation of solution.

When the accompanying mischief does not prove destructive to the organ, and the cataract does not undergo solution, or even when the process is very tardy, the surgeon should perform the anterior operation for solution ; and repeat it, if necessary, as recommended in ordinary cases of soft cataract.

Now and then, the entire lens, or large fragments, become dislocated into the anterior chamber, in consequence of a wound or blow; in all cases they should be immediately extracted; or distressing, and perhaps destructive inflammation may ensue. Even when the retina is paralysed, this should be done, as it will prevent much suffering.

OF LOSS OF THE POWER OF ADAPTING THE
EYE TO NEAR AND DISTANT VISION.

I HAVE stated, that I believe the alteration in the focus of the eye is produced by a change in the figure of the lens, so that its surfaces are more convex when looking at minute and near objects, than when viewing large or distant things. I believe, further, that the power which produces the change in the lens, is not in the lens itself; but is, probably, connected with the ciliary processes; though I do not pretend to be able to offer proof of such an opinion.

I have thought it best to place the present subject in connection with affections of the lens, conceiving its functions to be imperfect.

Either distant objects can be distinguished readily and accurately, whilst near objects of small or minute size are indistinct; or the perception of distant objects is confused or indistinct, whilst those near are seen more clearly and readily. Symptoms.

I have only known the former condition to exist, without evidence of other disease or disturbance of the organ ; whilst the latter has always been connected with other symptoms of morbid action.

In most instances in which distant objects only are seen distinctly, the patient derives much advantage from the use of powerful convex glasses, which enable him to distinguish objects near him ; but I have not found a patient who has lost the perception of distant objects, to be benefitted by employing convex glasses.

Causes.

I have previously described, that loss of focal adaptation of the eye, is usual in those cases, in which a general defect of visual power results from want of proper exercise of the organ ; and that the vision is generally much improved by convex glasses, especially as regards objects placed near the individual ; provided that the retina retain a moderate degree of sensibility : and I have further stated, that this defect subsides, as the general power of the retina improves, under proper exercise. Whatever the power which produces the focal change, it is evident that it requires exercise to maintain it in perfection.

I have also stated, that a deficiency or loss of this power of adapting the eye to various distances, exists in connection with cases of imper-

fect organic amaurosis ;—most frequently, the patient sees large objects at a moderate distance best, and the same objects, if brought near to the eye, become indistinct ; but are rendered again comparatively clear, by the aid of convex glasses.

In a few instances, I have found that patients, in whom incipient organic amaurosis has been developed, have been able to perceive near objects of moderate size, with tolerable distinctness ; whilst distant objects of large size, could not be discerned ; but in such cases I have never known the vision improved by artificial lenses.

Two remarkable cases have come under my observation, in which the patients had lost the power of adapting the eye to near and distant objects, without any evidence of other functional or organic disturbance.

137. A young gentleman, aged fourteen, whilst Case. at school, found his vision affected in both eyes, so that he could not read when the print was placed at the ordinary distance from the eyes, but he was obliged to place his book at an inconvenient distance to enable him to learn his lesson : by degrees, this defect increased, to such an extent, that he was incapable of reading or writing ; though he could distinguish distant objects as well as ever. The medical gentleman who was requested to see and treat the case, tried the

effects of leeches, blisters, and purgatives, keeping the patient quiet, and allowing him a very moderate quantity of food ; but, finding no improvement after a few days, he brought the boy to London for my advice : he said that his distant vision was perfect, but I found that he could not make out a common octavo print, unless with the assistance of a convex glass of four or five inch focus, with which he could see very small and minute things perfectly. I made several very careful examinations of the eyes, but could not detect the slightest organic or functional error ; the aspect, the feel, the movements of the various parts, and of the whole, appeared perfect : the affection had existed about six weeks previous to my seeing the young gentleman.

I recommended mild alterative medical treatment ; occasional counter-irritation in the forehead by blisters, and a plain diet ; and desired that the patient should be kept tranquil, and that he should not attempt to exert the organs, unless a favorable change occurred. No further unfavorable symptoms arose ; and, after a few weeks continuance of the treatment I recommended, the boy began to perceive some improvement in vision : by slow degrees, he recovered the power of distinguishing near and small objects ; and within a period of three months from my first seeing him, he had perfectly recovered. I

had opportunity of knowing that no relapse occurred.

The supposed cause of this defect, was a severe blow from another boy in a fight at school; it had been received many days before the vision became disturbed; and in the interval, the boy had been as well as usual; not suffering from headache, or giddiness, or any other disorder of head or eye.

138. The second case was very similar, except- Case.
ing that it affected one eye only. It occurred in a young gentleman, aged sixteen, who had received a blow on the forehead a few weeks before defect of vision was perceived. I found the pupil of the affected organ rather larger than that of the perfect eye; and the motions of the iris not quite so active as those of the other organ. The patient recovered gradually, but perfectly, under the same treatment as that adopted in the former case.

I cannot determine, in my own mind, the immediate or proximate cause of this affection.

The cases afford to me the clearest proof that a change does occur in the healthy organ, by which the focus is altered, and the eye adapted to distinguish, accurately, near and distant objects.

OF NEURALGIC AFFECTION OF THE EYE.

I HAVE designated this complaint, *neuralgic*, because I have not been able to detect any thing like inflammatory action, and very rarely even any congestion of the organs.

Symptoms.

Usually, the patients are seized with severe pain in the eyes whenever they endeavour to employ the organs for minute purposes ; or when they are exposed to a bright light. In most cases, the pain does not occur until the eyes have been employed for some time, and this is common when the affection commences ; but if it continue, the pain, by degrees, comes on after a shorter period ; and, at length, occurs as soon as the eyes are put in exercise. The pain is, at first, confined to the eyes ; but after a time, in many cases, it extends to the forehead. Occasionally, the patients suffer from the pains when the eyes have been kept quiet ; and these attacks of pain, are usually dependent upon change of weather, or some derangement of the health.

There is generally intolerance of light ; and the patient often experiences some relief by pressing the eyeballs forcibly with the hand.

Rarely is there any morbid appearance : I Appearances. have, in some cases, observed that the pupils have been smaller than natural ; and the irides inactive.

This, as many other local neuralgic affections, Causes. is, I believe, generally connected with a peculiar condition of the system. When once the morbid affection is manifested, it is generally excited and promoted, by much use of the organs, or by exposing them to brilliant light. I cannot, however, consider the disease always to result from over exercise or exposure of the eyes, because I have frequently found it, in persons who have not been subject to such causes.

The complaint most frequently commences at Persons a young period of life ; and attacks females much liable to. oftener than males ; and especially those of both sexes, who are not naturally robust, and who possess unusual nervous susceptibility. I have seen a few examples of this disease in elderly patients.

The most important part of the treatment of Treatment. these cases consists in the employment of general remedies to correct the state of system, which, in my opinion, principally influences the local complaint ; yet, at the same time, much relief

may be afforded, and the cure greatly promoted, by local means.

The general treatment should be directed to promote a proper state of secretion, to maintain a sufficient power in the circulating organs, and to subdue excess of nervous susceptibility ; much may be effected in these respects, by diet, exercise, and clothing ; particularly when aided by a pure and dry atmosphere.

The diet should be nutritious, but not stimulating ; the exercise regular but moderate, and not to produce fatigue ; and the clothing warm, but light. The patient should refrain, as far as possible, from any anxious mental business ; from using the organs for minute purposes ; and from exposing them to much light.

Medically, a mild alterative, and tonic course should be adopted ; and the form of medicine administered should vary, according to the peculiar character of the general derangement. Some of the most distressing cases of this kind which I have seen, have been in young and delicate females, subject to deficient or irregular uterine action ; or in those evincing a marked hysterical diathesis ; and to such patients I have given steel, and zinc, with valerian, castor, or galbanum, &c. Otherwise, I have prescribed small doses of mercury with a tonic, as sarsaparilla, bark, &c.

At the same time I have employed, locally, counter-irritation by mustard, ammonia, or blisters; and directed the eyes to be bathed frequently, with a tepid narcotic lotion.

The cure is, usually, protracted in this disease, in proportion to its previous duration; it generally requires much time; and is, in many cases, excessively tedious, occupying a period of years. During treatment, the patient is very subject to relapses, which dishearten him, and destroy his confidence in the medical adviser; so that very often he does not remain under the same medical man long enough to allow him to subdue the disease.

OF ARTIFICIAL PUPIL.

UNDER this head I shall consider,

1. The mode in which the natural position of the pupil may be altered with advantage.

2. How it may be extended, when it has been so contracted or diminished, by accident or disease, as to render it of little use.

3. The methods of forming a new opening or pupil in the iris, without injury to the crystalline lens, when the original pupil has been destroyed.

4. The formation of a new pupil, when the original aperture has been destroyed, and the lens removed or lost.

5. The treatment, by operation, of those cases in which the pupil has become obliterated or closed by opake matter, and the iris adheres to the capsule of the crystalline lens—the capsule being opake and thickened.

OF CHANGING THE NATURAL POSITION OF
THE PUPIL.

THERE are two classes of cases in which this operation may prove advantageous.

1. The cases in which the cornea has become so conical, that accurate perception of minute objects is lost.

2. Those in which the central portion of the cornea is rendered permanently opaque by injury or disease ; as from the contact of a strong escharotic, or from the healing of a wound, or large ulcer.

I have already explained, on the subject of conical cornea, the principle upon which I have adopted an operation to change the position of the pupil.

In the cases of dense, permanent, central opacity of the cornea, the object of the operator must be manifest:—viz., to bring the aperture of the iris immediately under a part of the cornea which retains its transparency, so that the rays of light may pass uninterruptedly to the retina.

In both instances, the change of the pupil is effected by the same plan and means ; and when

the position and extent of the opacity of the cornea does not forbid, the pupil should always be brought downwards and outwards. Now and then, however, the operator is compelled to alter it to another direction, when the opacity of the cornea extends much over the lower and outer part of it.

If the surgeon cannot change the position of the pupil in the direction outwards or downwards, he should direct it downwards, if that part of the cornea be clear ; and never, unless compelled by circumstances, should he draw the pupil upwards.

The instruments required in the performance of the operation are a broad needle, and a fine blunt hook, with a long bend. (*Tyrrell's Hook* ; see plate 9.)

The patient should be placed as if about undergoing* an operation for cataract. The broad needle should then be carefully passed through the cornea, close to its junction with the sclerotic, and at that part of its margin which corresponds to the interval between the depressor and abductor muscles : in pressing the needle through the cornea, one flat surface should be parallel to the surface of the iris, and the other, of course, directed forwards—the instrument should be made fairly to penetrate the anterior chamber of the eye ; but should be kept quite

free of the iris; it should not be passed so far as the pupil. The puncture of the cornea usually admits of the escape of some portion of the aqueous humor; but, if it be carefully made, a very small portion of the fluid only exudes; and it is advantageous to retain such a quantity that the hook may be carried into the anterior chamber without risk of entanglement in the iris.

The hook should be passed with the bent limb towards the cornea, or forward; and then it should be carried as far as the aperture of the pupil; and, the extremity of the instrument being introduced through the pupillary space, the bent part of the hook should be directed backward, by half rotating the handle of the instrument between the finger and thumb. The pupillary margin of the iris should next be caught by the hook, by pressing the point gently towards the surface of the lens, at the same time that the instrument be carefully withdrawn. When, however, the bent part of the instrument is withdrawn, as far as the opening in the cornea, its passage will be generally impeded, whilst the point is directed backwards, as when catching the margin of the iris: it is then again necessary to half rotate the handle, so as to direct the bent limb forwards; but, in doing this, the instrument must not be allowed to recede from the opening in the cornea, or the

iris may slip from the hook. The hook being directed forwards, and still retaining a hold of the pupillary margin of the iris, should then be withdrawn through the corneal puncture, bringing with it part of the iris; and sufficient of the membrane should be drawn through the opening in the cornea, to effect the desired change in the position of the pupillary aperture of the iris.

The pupil, of course, loses its circular figure, and becomes pear-shaped, and narrowest immediately in connection with the puncture in the cornea.

The piece of the iris drawn through the opening in the cornea, may be cut off by a fine pair of scissors, or left to separate by ulceration. I usually cut it off, as it lessens the after irritation of the organ.

Another reason for cutting off the portion of iris drawn through the wound is, that it may recede, and the pupil regain its original position. I have known this happen, but only in one case, in which I had made the opening in the cornea with a knife instead of a needle; the opening was, perhaps, of larger size than was necessary. If a needle be used to puncture the cornea, which will effect an opening just sufficient to admit the hook, the part of the iris, which is drawn through the opening, will be sufficiently

held, to prevent its return into the anterior chamber.

If the hook be properly made and carefully used, there is very little risk of injuring the capsule of the crystalline lens; I have performed the operation very many times, and never inflicted mischief upon the capsule or lens. After the operation, the patient should be treated, as subsequent to the needle operation for cataract. The eye can, in most cases, be used after three or four days; but this must, of course, depend upon the subsidence of irritation or inflammation consequent on the operation.

OF ENLARGEMENT OR EXTENSION OF A DIMINISHED PUPIL.

If the anterior chamber be opened by wound, or ulceration of the cornea, so as to admit of the escape of the aqueous fluid, prolapse of the iris usually follows; and, frequently, occurs to such an extent as to displace and diminish the natural pupil, and, in some cases, to destroy it. It also frequently follows that a dense and permanent opacity results from the healing of the wound, or ulcer; (especially from the latter;) and that

this opacity covers or obscures the displaced and diminished pupil, so as to render it useless: this opacity occurs with synechia anterior. Under these circumstances, the operation last described should be performed, and with attention to the same points. There is, usually, much less choice of position for extension of the pupil in these cases, than in those just described.

On operating in some of these cases, I have found that a simple fissure has resulted from drawing out the iris as I have directed; and, under such circumstances, I have performed a second operation on a similar plan; but have made the opening in the cornea in a new position, so as to enable me readily to extend the fissure resulting from the first proceeding: thus, if I have at first made the opening in the cornea at the outer and lower part, and effected only a fissure instead of a fair sized pupil, as soon as the eye has recovered from the effects of the first operation, I have made a second opening through the cornea, a little above the centre; and, seizing the upper margin of the fissure in the iris with the hook, I have drawn it to, and through the puncture of the cornea; and thus formed a triangular shaped opening in the iris;—two angles corresponding to the punctures in the cornea, and the other to the position of the wound or ulcer which had been productive of

the original alteration in the pupil, and rendered operation necessary.

There may be, perhaps, rather more difficulty in avoiding injury to the capsule of the lens, in those cases, than when the iris is free; but I have never yet been the cause of such mischief. I have frequently effected this operation without losing more than two or three drops of the aqueous humor: in which cases, the patients have, as it were instantaneously, recovered good vision; and, several times, patients have been able to read easily a common sized octavo print, without aid of a glass, (for the crystalline lens and its capsule remain perfect,) within a minute or two subsequent to the operation; before which, they had not been able to discern more than difference in the degree of light, or of brilliant and vivid colors.

In many of these cases, however, the patient requires the aid of a convex glass to distinguish, distinctly, minute objects; this results from difference in the distance between the lens and the cornea from that which naturally existed, as well as, perhaps, also, from some flattening of the cornea, produced by the injury and its reparation.

139. I first noticed this fact, accidentally, in Case.
a young man, one of the early cases submitted

to this operation ; he had dense opacity in each cornea with adhesion of iris, or synechia anterior ; and the original pupils had been very nearly destroyed : the clearest part of each cornea was, fortunately, the outer and lower, and I succeeded easily in extending the pupils beneath such parts : he directly obtained a distinct and accurate view of large and moderately sized objects ; but he could not see a large print. Some few days after the operation, he came to me, in great glee, having discovered that he could see to read perfectly well and easily, with some glasses belonging to an old person who resided in the same house with him. The same circumstance has presented itself, as regards the necessity for aid from glasses, in several other cases which I have had occasion to operate upon.

Sometimes the disease, which destroys part of the cornea, and allows of escape of aqueous fluid, prolapse of iris, &c., is also followed by an irregular projection of the cornea, or the production of a partial staphyloma, which causes a constant state of irritation in the eye. This should, if possible, be remedied before an attempt be made to extend the pupil ; otherwise, the operation will prove of comparatively little use, as the constant irritable condition of the eye will prevent

the patient from using the organ, even should the operation succeed in enlarging the pupil as desired.

I have succeeded in reducing the staphyloma, and restoring the eye to a quiet condition ; first, by promoting and maintaining a good state of the general health ; and, then, by a very careful application of nitrate of silver to the staphyloma itself.

140. A gentleman, about twenty-eight years Case. of age, holding a situation in the Custom-house at Liverpool, was attacked with acute purulent ophthalmia which entirely destroyed his right eye, so that it collapsed, and it occasioned a slough of nearly one half of the left cornea ; on the separation of this slough, the aqueous humor escaped and the iris protruded so as nearly to destroy the original pupil. During the healing process, partial staphyloma formed ; and the remaining pupil, (about the size of an ordinary pin's head,) became obscured by opacity of the cornea. The staphyloma was on the inner part of the cornea ; and, by looking at the eye obliquely from without, the small pupil could be detected beneath the opaque part of the cornea, which formed the base of the staphylomatous projection. The patient came to town in this state, being only able to distinguish light from darkness ; and, when he consulted me, among

others, I gave him such hopes of recovering some useful degree of vision, that he placed himself entirely under my care. I found his general health very much impaired, from the severity of the treatment which he had been submitted to, in consequence of the purulent ophthalmia; I first endeavoured to re-instate his general power, by placing him in good air, and giving him a generous diet and mild tonic medicines. He rapidly recovered in this respect, and I then began the application of the nitrate of silver in substance to the staphyloma, repeating it daily, or every other day, as the condition of the eye permitted. I began by lightly touching the base of the projection, where it had a bluish aspect indicating the thinness of its parieties; and as the part became more opaque and dense, from the action promoted by the nitrate of silver, I extended the application more to the summit of the staphyloma; and then, by degrees, succeeded in nearly subduing the projection, and, at the same time, rendering the deposit much thicker. The health being good, and the eye quiet, I enlarged the pupil downwards and outwards. On trying the eye twenty-four hours after the operation, he could see to read readily without aid of a glass, and soon returned to his duties in the Custom-house; and continued, for some years, to perform them without

inconvenience, although they principally consisted in writing.

141. In the spring of 1838, the wife of a Case. farmer, aged forty-seven, was brought to me, having lost her right eye, and with partial staphyloma, and the pupil nearly destroyed in the left; a case very similar to the former, excepting in the age of the patient, and the cause of mischief, which, in the female had been scrofulous ophthalmia, producing ulceration of the cornea. I first adopted dietetic and medicinal treatment to produce a good state of health; then, I applied the nitrate of silver, and reduced the staphyloma; and, subsequently, enlarged the pupil: the whole proceeding was most satisfactory, excepting that she only regained sufficient vision to be able to read a large print; but she stated that her eye had always been a defective one.

OF FORMING A NEW PUPIL WHEN THE NATURAL ONE HAS BEEN DESTROYED, THE LENS AND CAPSULE REMAINING PERFECT.

THESE cases also result from injury to the cornea by wound, ulcer, or slough, which penetrates the anterior chamber, and permits escape of the

aqueous fluid with prolapse of the iris, to so great an extent, that the original aperture is lost.

Supposing as much as two-thirds of the cornea, or less, to become opaque, and the iris adheres in the cicatrix, (*synechia anterior*,) without any staphyloma, I adopt a modification of the last operation to effect an artificial opening in the iris, behind that part of the cornea which retains its transparency, making the opening, as much as possible, in the direction downwards and outwards. I introduce the same broad needle through the margin of the cornea, into the anterior chamber, and direct it across the space of the chamber which remains; and cause it to penetrate the iris close to its adhesion to the cornea, being very careful not to pass the point of the instrument backwards; because I believe that, in such cases, the capsule of the lens is nearly or quite in contact with the posterior surface of the iris. I make a very small opening in the iris with the needle, and then withdraw it. Immediately afterwards, (whilst I have in view the points wounded by the needle,) I pass the blunt hook, and introduce its extremity through the opening made by the needle in the iris, having the bent limb of the hook directed forwards, until it has passed through the aperture; then, by half rotating the handle as

before described, I direct the bent limb backwards towards the capsule of the lens, and gently withdraw the instrument in the direction of the lens, with as little pressure as possible : usually, the iris tears from the point which has been caught by the hook, and such a quantity of the membrane can be brought through the opening in the cornea by the hook, as will effect a sufficient aperture in the iris : but, sometimes, only a fissure results, as in the operation before explained ; and this fissure will require enlargement, as in the former instances, and in the same way : I have thus made artificial pupils, in many cases, when much less than one-third or one-fourth of the cornea alone retained its integrity.

The principal risk, in these cases, arises from being obliged to use a pointed instrument to effect an opening in the iris, to permit the passage of the hook, the proximity of the capsule of the lens being so close to the iris that it is easily injured, when cataract follows ; but even when cataract exists previously, or follows from injury during the formation of the artificial pupil, good vision may be generally obtained, by the aid of a cataract glass, if the surgeon aid the absorption of the lens by careful means, which have been described. (*See Drilling.*) The operation may be modified, when the remains of clear cor-

nea are very small, by making the opening into the anterior chamber through the margin of the cicatrix, or opacity of the cornea, and the puncture in the iris at its outer circumference near to the ciliary ligament; and then by drawing the iris from the site of such puncture to the opening in the opaque part of the cornea. I much prefer the mode I have before described, because I find the artificial pupil to be more useful, in proportion as it is effected near to the centre of the cornea, or most distant from the ciliary ligament: in this latter case, if an opening be made, the ciliary processes necessarily interfere somewhat with it. Perhaps, however, there may be less risk of injury to the crystalline lens in the latter than in the former operation. I have very rarely inflicted injury to the lens in the operation first described.

OF FORMATION OF A NEW PUPIL WHEN THE
ORIGINAL OPENING IN THE IRIS HAS
BEEN DESTROYED, AND WHERE THE
CRYSTALLINE LENS HAS BEEN LOST.

This most frequently happens after the operation of extraction of a cataract, which is followed

by large prolapse of the iris ; but it also results from wound of the cornea, &c., which allows of the escape of aqueous and crystalline humors, and is also followed by prolapse of the iris. In both of these instances, there is usually some considerable opacity of the cornea ; and the portion of the iris which remains sound is placed on the stretch.

Occasionally, after the removal of the lens, by extraction or by solution, the pupil closes, in consequence of inflammation of the iris ; or the aperture becomes exceedingly contracted, and occupied by a dense and tough adventitious membrane, or capsule thickened by fibrous deposit : in this case, also, the fibres of the iris are much on the stretch ; which can nearly always be readily ascertained, as the fibres, observable on the anterior surface of the membrane, pass in straight radii, without any perceptible curve or bend.

The success of an operation for readily forming artificial pupil, in all these cases, depends upon the fibres of the iris being tense, so that they contract when divided.

When the eye is perfectly recovered from its inflammatory action, as far as can be effected, an opening should be made by a cataract knife, at the margin of the cornea, close to its juncture with the sclerotic, and of an extent of about a

quarter of an inch, sufficient to admit the blades of a fine pair of scissors, (*Maunoir's*, see plate 9, fig. 11,) and allow of their action ; the scissors should be introduced through the opening in the cornea, with the extremities closed ; but as soon as they have entered the anterior chamber, the scissors should be gradually opened, so that the sharp extremity of one blade penetrates the iris and passes behind it ; whilst the other blade, having a probed end, is carried carefully across the chamber ; and, when this is effected, the blades being again closed, the iris is divided, and the fibres, which had been previously on the stretch, immediately retract, and an oblong pupil, somewhat like that of a cat, directly results.

Unless there has been previous inflammation of the membrane, there is not usually any escape of red blood, so that the patient obtains vision directly ; but if red blood be effused, the pupil soon becomes obscured ; and, usually, some inflammation of the iris follows, which requires mild mercurial measures to subdue it. In all such cases, cold should be applied directly after the operation, and continued for two or three hours, during which time the patient should be kept erect ; otherwise, he should be treated, as subsequent to extraction, for several days, until the wound of the cornea has healed, and until the effused blood is re-

moved by absorption. When the eye feels full or tense after effusion of blood, leeches should be freely applied ; or some blood taken from the arm, should the age or condition of the patient not forbid ; and mercury and opium should be administered as soon as possible.

The cases in which the pupil has been closed by iritis, are the most unfavorable for this operation ; as there is great proneness to renewed inflammatory action, under which the artificial aperture is likely to be closed : for this reason, I am always careful to make a free opening in the iris, in such cases, and to aid the retraction of the fibres, by pressing the edges of the aperture in the membrane with the extremities of the scissors, before I withdraw them, after dividing the iris.

A simple division of the iris by Maunoir's scissors, as already described, can, in most of such cases, be practised with success ; but if the iris be flaccid, the fibres do not contract when divided, and the edges of the wound, falling in contact, speedily re-unite, and defeat the purpose of the operation. Under such circumstances, then, it is best to make a double division of the membrane, so that a good sized opening may be directly formed.

In making a double division of the iris, the cornea should be opened, as when a simple divi-

sion of the membrane is intended, and the scissors should be introduced in the manner already described ; but, at first, the extremities should be directed from the outer and lower part of the anterior chamber, to the upper and inner part, and a division of the iris accomplished in that direction : the scissors must then be again introduced, and the point directed inwards and a little downwards, and thus another division of the iris should be effected, joining the first near to the opening in the cornea, but diverging from it at its furthest point. A triangular flap of iris is thus formed, having its apex near to the wound in the cornea ; and, after the second division of the membrane, this flap should be depressed towards the vitreous body, by the extremities of the scissors ; otherwise, it may easily re-unite. I used formerly to take out a piece of the iris ; but I afterwards found the above modification of the operation to answer exceedingly well.

It is, I consider, advantageous to submit patients, requiring such operations, to a mild alterative or mercurial course, before the operation is performed : this plan, carefully conducted, cannot do any harm, and it often effects much good, in causing a partial absorption of effused matter, so that the distinction of light becomes increased ; and further, I believe that it tends

much to destroy the disposition to recurrence of diseased action after the operation.

I have met with a few cases in which a very small portion of the cornea has retained its healthy character, the larger part having been destroyed by slough, or ulceration, effecting an opening, through which the lens has escaped. The space to work in has been too small to allow of the use of scissors, and I have, therefore, been obliged to adopt other means. I have tried two modes to make artificial pupils, in these cases :

First,—using the broad needle and hook ; making an opening with the former, for the passage of the latter, through the opaque cicatrix, and another in the iris, at its point of adhesion to the cicatrix ; and then, with the hook, tearing away a portion of the iris, as before stated.

Secondly,—I have used only a stiff needle with an acute point, just sufficient to make it enter easily. I have introduced the needle through the conjunctiva, sclerotic, &c., about the one-eighth of an inch from the place of union between the sclerotic and cornea, and have carried it on through the iris, close to where it adheres to the cornea ; and then passed it across the small remaining space of the anterior chamber, keeping it close to the outer circumference of the iris. I have next pressed one flat surface of the needle on the iris, so as to separate it from its

Iris separated
from ciliary
ligament.

attachment near the ciliary ligament, and thus created an aperture. After several trials, I abandoned the last described operation, having found the former more effective, and less liable to promote inflammation.

Drilling.

I have previously described the treatment by operation of those cases in which the pupil becomes closed in consequence of iritis, attended with synechia posterior, the lens remaining. *See Operation of Drilling.*

Remarks.

In many cases, the operation of forming an artificial pupil requires as much delicacy of manipulation as the operation of extraction.

Very great advantage has resulted from the introduction of the small blunt hook, inasmuch as it enables the surgeon, in many cases, to form a pupil without injury to the lens, which was not, I believe, previously attempted.

The success of these operations depends very much on their proper application, independent of the skilful performance of them;—the surgeon should be always careful to select that operation which occasions the least violence to the organ, provided that it be likely to succeed.

OF SHORT SIGHT.

MYOPIA, from *myo*, to shut, *ops*, the eye ; be-
 cause short-sighted persons do not usually open
 the palpebræ freely. Synonyme and
Derivation.

An incapability of distinguishing distant ob-
 jects, and also those of small size, unless placed
 nearly close to the eye. The extent of this de-
 fect varies very greatly ; sometimes the patients
 can see to read easily a small print at a distance
 of a few inches from the eyes, whilst others can-
 not distinguish such print unless it be placed
 nearly in contact with the cornea. Symptoms.

Most frequently the cornea is found to be
 unusually convex ; but, occasionally, the cornea
 presents a common curve, and the lens is very
 convex. Appearances.

This is, generally, a congenital and hereditary
 defect : I have seen several instances in which it
 has occurred in children of seven, eight, nine, or
 ten years of age, and has gradually augmented
 till the period of puberty. Causes.

It is also a consequence of long continued disease of the cornea, which does not permanently affect its transparency. *See Corneitis, and Vascular Cornea.*

Treatment.

The only remedy is that supplied by the optician, viz., the concave lenses ; and in selecting glasses, the patients should be careful not to take such as cause a diminution of the object looked at, when placed at a moderate distance : the spectacles should make the objects distinct, but not cause them to appear smaller than natural.

When the defect is congenital, or when it occurs at an early period of life, glasses should be worn, when the eyes are engaged in minute work ; otherwise, the eyes are likely to become congested, and the patient to acquire an awkward stoop.

OF LONG SIGHT.

PRESBYOPIA,—from *presbys*, old, *ops*, the eye ; Synonyme and Derivation.
as occurring in old persons.

An incapability of distinguishing minute objects, Symptoms.
when held near the eyes—thus, persons between fifty and sixty years of age may be observed, when reading a small print, as that of a newspaper, to hold it nearly at arm's length from the eye, and, at the same time, to obtain as much light as possible upon the paper. This condition of vision generally comes on so imperceptibly, that the patients are not often conscious of the change, until they are obliged to hold the small objects so far from the eye as to excite remark from those about them, or until the focus becomes so altered that they have difficulty in reading small print.

The cornea is usually less prominent in el- Appearances.
derly than in young persons, and I believe that the lens also loses a little of its convexity, and that it acquires a greater consistency ; so that

the changes in its figure, (which I consider the principal source of the alteration of the focus of the eye,) do not take place to the same extent, as in early life.

I have known this state of vision in young persons; and I believe such cases have been congenital.

A similar condition occurs from a morbid action, which I have already treated of. *See Loss of Power of Adaptation.*

Treatment.

The vision can only be improved, in these instances, by the use of convex glasses; and in selecting spectacles, patients should choose such as render minute objects distinct, without increasing the size. Glasses should be procured as soon as the defect is discovered; for independent of the comfort of the artificial aid, the eyes are saved from liability of congestion, which is often induced by the unusual effort required to peruse small print, without the aid of convex lenses.

ON THE USE AND CHOICE OF GLASSES.

WHENEVER a natural defect of vision can be relieved or obviated by artificial lenses, the artificial aid should be obtained and employed as soon as possible, supposing the organs to be free from all morbid action : thus the short-sighted person should be provided with concave glasses, and the long-sighted with convex glasses ; and the selection of the spectacles should be made as I have directed in connection with these subjects.

Further, it is essential that such persons should have two glasses, or spectacles, and not a single glass ; for when a single glass is used, only one eye is employed ; and that not exercised becomes imperfect and useless for minute purposes.

When it was the fashion to wear a single eye glass, very many persons lost useful vision in one eye, in consequence of the almost exclusive employment of the other for minute purposes.

If then a patient object to the ordinary spectacles, he should procure such as can be worn attached to a chain or ribbon round the neck, but with two glasses.

It is a matter of considerable importance, that the glasses should be made of good material, and accurately ground, that the refraction may be as perfect as possible : further, that the power of the two glasses should be as equal as possible. Much optical knowledge and care are required to manufacture and fit up spectacles with accuracy ; it can only be accomplished, in my opinion, with any degree of certainty, by the intelligent and experienced optician—and I would, therefore, strongly advise those requiring glasses to apply to such a person, and most carefully to avoid the advertising opticians of all classes.

When it is desirable to protect the eyes from bright or much light, I consider the thin plain glasses, possessing a neutral or dark tinge, to be best, as they simply modify the light without affecting the color of surrounding objects.

Blue or green glass modifies the light very agreeably, but it frequently produces an unpleasant effect afterwards ; for when dark blue or green glasses have been worn for many hours together, on their removal, all objects appear to the patient tinged with red ; and, occasionally, he also suffers from uneasiness in the eyes, and

this more especially when the colored glasses are very dark, and have been worn a long time ; for the eyes are then distressed by a moderate degree of light.

When it is necessary to protect the eyes from wind as well as light, side pieces may be added to the spectacles of plain tortoiseshell, or a light frame fitted with gauze ; but I prefer the neutral tinged glass before the eye.

It is only in very aggravated cases of lippitudo, or in cases of extensive chronic ophthalmia with an irritable state of the organs, that goggles are required during the time the patients may be exposed to cold and wind ; even then they augment the local evil, by producing an unusual degree of heat, and confining the secretion, though the mischief is less than would result from exposure of the eyes to cold and damp wind.

ADDENDA.

SINCE the printing of that part of the first volume relating to diseases of the conjunctiva, cornea, &c., was completed, a case of much interest has occurred at St. Thomas's Hospital, affording further evidence of the modification of severe disease of the conjunctiva and cornea, by extreme exhaustion of general power.

A little boy, aged six years, was brought to the hospital, in an extreme state of feebleness and emaciation, and having severe inflammation of both eyes; the palpebræ were tumid and of a dull red color; the cilia were loaded with a muco-purulent secretion; the palpebral and ocular portions of the conjunctiva were red—the former being thickened and villous, and the latter being partially raised by subjacent deposit; (partial chemosis;) the right cornea was deeply and extensively ulcerated in the centre; the ulcer had penetrated the anterior chamber, the

aqueous humor had escaped, and the iris had in part prolapsed so as to plug the opening ; a little muco-purulent secretion adhered to the protruding iris, and the surface of the ulcer was perfectly transparent : a smaller ulcer existed on the left cornea which had not penetrated the whole structure ; the surface of this ulcer was also transparent.

The poor little fellow had suffered from exanthematous fever, which had assumed a typhoid character ; and whilst in a state of debility from this cause, the ophthalmia had commenced ; and although it had existed only a few days before he was brought to the hospital, it had occasioned the mischief which I have described.

Besides the appearances of severe ophthalmia, the little patient complained of much pain, and he was much distressed by exposure to light.

Being satisfied that the local disease was modified by the state of the general health, my principal attention was given to improve the general power. The boy's tongue being clean and his bowels regular, I ordered him a good plain diet of animal food and farinaceous matter, and prescribed eight drops of the solution of yellow bark in half an ounce of port wine every six hours ; and a little calomel and rhubarb, should his bowels be confined. I directed two drops of a solution of nitrate of silver, (one grain

to the ounce of distilled water,) to be dropped into each eye once or twice in the day, until the surfaces of the ulcer appeared cloudy or opake, and that the palpebræ should be kept clean by occasional use of warm poppy decoction. Besides, I had some belladonna applied to the right eye-brow constantly, in the hopes of producing retraction of the iris.

The result of this treatment was most satisfactory : the healthy action commenced in the eyes in less than forty-eight hours—the conjunctival redness and thickening being much diminished ; the muco-purulent secretion arrested ; the organs free from pain, and able to bear exposure to a moderate degree of light ; and the surfaces of the ulcers covered with deposit of fibrin. On the ninth day from his admission, the ulcers were healed, and the ophthalmia was perfectly subdued ; and the little fellow had regained much flesh and strength : his appearance was altogether so changed, that those who had not seen him in the interval could hardly have recognised him.

He has now a small opacity to the outer part of the left cornea, but his vision is perfect with that eye ; in the right cornea there is a dense central opacity, with synechia anterior, and the original pupil has been nearly destroyed ; what remains is covered by the opacity of the cornea,

so that it is of no use to him. I intend to alter the position of the pupil, or extend it downwards and outwards, beneath a part of the cornea which still remains clear.

This case was analogous to that which occurs after small-pox, &c. *See case 29.*

I consider the following case of sufficient interest to be worth relating; but from its peculiarity, I could not well place it in connection with disease of any particular structure.

Case.

143. A young gentleman, aged thirteen, accidentally wounded his left eye with a penknife; the point of the knife penetrated the cornea at its outer part, but the injury was followed by very trifling immediate inconvenience or uneasiness. Two days after, he was exposed for some hours to a cold wind; and on the following morning he suffered from symptoms of acute inflammation in the eye: active depletory measures were directly adopted; as, general and local bleeding, purgatives, &c.; and in the course of the day, the patient was seen by a surgeon of high reputation and intelligence, who found a small part of the cornea, at the margin of the wound, in a state of mortification, and the iris much inflamed. Under careful mercurial treatment, the iritis was soon subdued; and the patient's power being properly supported, the slough separated from the cornea; but a small opening into the anterior cham-

ber resulted, through which a portion of the iris protruded: a healthy action soon commenced, and the ulcer of the cornea appeared to be rapidly filling up, when the patient was attacked with great irritability of stomach, and vomiting, from which he had frequently suffered before the injury to the organ: the vomiting was very violent, and occasioned great pain in the eye; and on the next day, a vesicular projection was perceived from the position of the wound.

The surgeon, desirous of preventing the formation of a partial staphyloma, punctured this vesicular tumor, so as to evacuate a little of the aqueous fluid, and this was followed by an immediate collapse of the vesicle: this plan of treatment was followed up for more than a month, so that whenever slight projection occurred, it was subdued by puncture; and, by degrees, the disposition to projection became less and less, as the new-formed matter became thicker and more resisting: when the disposition of the cicatrix to yield appeared to have ceased, the young gentleman left the country to join the family in London, having to travel above seventy miles; during the journey, in an easy carriage, he had another severe attack of sickness, and violent vomiting, during which the eye became excessively painful, and he also experienced much pain above the eyebrow, and the cicatrix again protruded: the

irritability of the stomach, and the pains in the globe and brow, continued after he arrived in town.

Soon after his arrival, he was seen by an eminent surgeon, who directed local bleeding, and prescribed calomel and opium; yet the pain continued, and the stomach remained so irritable, that the patient could not take food, without causing vomiting, and the local distress prevented his obtaining any refreshing sleep. Several days elapsed and the sufferings increased, instead of diminishing; yet the surgeon objected to make a puncture of the projecting part of the cornea; considering the practice dangerous, and not calculated to effect any permanent good. On the fifth day after the young gentleman had reached London, and whilst the distressing symptoms continued, the surgeon who had attended him in the country, came to town, and called to see his former patient; and finding him in so much suffering, requested a consultation with the surgeon who then had charge of the case: the result of the conference was not satisfactory, inasmuch as the London surgeon would not sanction a puncture of the partial staphyloma, which the provincial surgeon was most anxious to adopt, having previously found that the patient had been invariably relieved from all local uneasiness when he had performed this operation in the country.

In the evening, the distress of the patient became so great that his parents sent for the provincial surgeon, who was still in town, and they intreated him to puncture the projection on the cornea ; which he did—hoping that the peculiar character of the case, and his position with respect to the family, would be a sufficient excuse for the breach of professional etiquette : the relief afforded was almost immediate ; after a few minutes, all local pains ceased, and the patient no longer felt nauseated : within half an hour he ate a mutton chop eagerly, and with relish, and soon after he went to sleep, and slept tranquilly for several hours.

On the next day, the London surgeon expressed himself so strongly in opposition to the treatment which had been adopted, that the parents of the patient declined his further attendance, and I was requested to see him ; when I obtained the particulars contained in the foregoing statement.

I found the patient with a feeble and irritable state of circulation, rather pallid and depressed, but the principal secretions in good order ; a spot about the diameter of a common pea existed at the outer part of the left cornea, having a white margin, with a bluish centre, and a dark point indicating the attachment of the iris ; the pupil was pear-shaped, and small, but the pa-

tient could distinguish large objects, and bright colors ; a slight degree of ophthalmia existed. The day after my first visit, the cicatrix began again to rise, and after a few hours the pain in the globe and the brow was felt, and soon became severe ; at the same time, the stomach became irritable, and much nausea, with occasional vomiting, supervened. I then punctured the staphyloma, and let out three or four drops of aqueous fluid, sufficient to destroy the projection, and relieve the tension : all now became quiet again, and the patient could eat, drink, and sleep, as usual ; the tranquillity was not, however, of long duration, in two or three days a fresh projection took place, attended with the same ocular and supra-orbital pains, and the irritable state of stomach, which was only again relieved by puncturing the cicatrix of the cornea.

Having carefully watched my patient, and having ascertained that he was free from all important functional derangement,—except that of the stomach, which only occurred in connection with a certain condition of the eye, and which was, in my opinion, sympathetic with the state of the eye,—I prescribed a mild alterative treatment, and the friction of blue ointment and opium to the forehead, above the eyebrow ; believing that the local morbid action would be subdued most rapidly and effectually by general

treatment; whilst it might be in some degree mitigated by local means: still, however, the distension of the cicatrix of the cornea occurred every three or four days, attended with distress of stomach; but we succeeded in lessening the degree of nausea, and preventing vomiting, by giving small doses of spirits of ammonia and black drop, which he had experienced relief from, when he had had attacks of irritability of the stomach, before he injured the eye.

In consequence of the frequent recurrence of the ocular distress, and gastric irritation, the opinions of most who had had experience in ophthalmic diseases, were sought for, and obtained; and a fair trial was given to all the plans which appeared to offer any prospect of relief—but no good resulted; and at length it was determined to pursue the alterative plan without interference for some weeks, as this plan had been more strongly approved of than any other, and had received the sanction of the greatest number of those who had been consulted about the case.

The patient then took very small doses of mercury, and a light tonic; and had a good, plain, nutritious diet: he was also allowed to take moderate exercise in the open air in fine and dry weather. In two or three weeks, there was a decided improvement; the patient was

better in health and strength, and the recurrence of the distension of the cicatrix was less frequent ; four or five, or five or six days having intervened between the operations of puncturing the staphyloma ; and these operations were only performed when the supra-orbital pain occurred, and he experienced nausea. At length, six, seven, and eight days elapsed without necessity for puncture ; and, suddenly, the disposition to distention of the cicatrix ceased, after nearly five months' continuance.

At first, I had used a very fine needle to puncture the projection ; but, subsequently, I employed one of large size, and, on several occasions, I divided the projecting part of the cicatrix with a cataract knife, so as to allow of a free escape of aqueous fluid ; this was followed by longer intervals of relief, and gave rise to a larger deposit of fibrin, which rendered the cicatrix more solid and resisting. I also applied the nitrate of silver freely two or three times ; but the good it effected, was not at all equivalent to the suffering it produced.

During the five months of treatment, the pupil of the affected eye diminished considerably, and the vision was so far destroyed, that little more than perception of light remained.

Shortly after, my patient returned to Eton school, and continued free from inconvenience

in the eye, or derangement of health, for nearly eighteen months ; he then felt occasional uneasiness in the globe ; and the cicatrix on the cornea, which had remained very slightly raised since he left my care, became evidently more prominent ; and, in consequence of these symptoms, he was brought up to town to me. I found the eye very irritable, and a partial staphyloma of such extent, that it impeded, a little, the movements of the upper eyelid ; the best eye was also slightly irritable from sympathetic influence ; the stomach was not affected.

My previous experience with the patient, made me dread the establishment of severe irritation ; and I, therefore, advised that the staphyloma should be removed so as to permit of the escape of sufficient of the humors, to cause a partial collapse of the globe. This has been done, and the result has been, at present, most satisfactory ; but, the recovery is not yet complete.

I have frequently seen irritability of the stomach induced by injury to the iris ; but not recurring, or so severe, as in this case : no doubt the original tendency to gastric irritation, greatly predisposed to this affection, in connection with the ocular disease.

The case is further peculiar, in consequence of the severe local suffering, which took place

whenever the cicatrix yielded ; for usually the partial staphyloma forms without any suffering : this suffering appeared, at first, to be a consequence of violent vomiting, which also occasioned the projection of the cicatrix ; but during the time that I watched the case, the reverse happened, for the ocular pains always preceded the irritability of the stomach.

Though the patient was not very strong, and more than usually susceptible, yet there was not any thing very uncommon in either respect.

The gentleman who had the management of this case at first, treated it much on the same principles, as those which ultimately succeeded in removing the distressing symptoms.

Prevention of
staphyloma.

He tells me that he has, in a few cases, prevented the formation of partial staphyloma, by not permitting distension of the deposit in large ulcers of the cornea ; always evacuating the aqueous fluid as soon as he has perceived any projection. I have also tried this plan, and successfully ; and have observed that the tendency to distension soon ceases when the deposit of fibrin is quick—in fact, as soon as the new matter has sufficient firmness to resist the pressure of the aqueous fluid.

GLOSSARY OF TERMS,

PRINCIPALLY EMPLOYED

IN OPHTHALMIC MEDICINE AND SURGERY.

Acrochordon, *ακρος*, extremus, *κορδυλη*, clavis caput.

A wart or small tumor having a narrow peduncle and large extremity.

Ægylops, *αίγι'λωψ*, abscessus inter nares et oculi majorem angulum.

An ulcer near the inner canthus of the eye.

Albugo, a white spot—

A dense opacity of the cornea.

Alopecia, *αλωπεκία*, defluvium capillorum.

A dropping off of the eyelashes.

Amaurosis, *αμαυρω*, obfusco.

Loss of vision from defective nervous function.

Amblyopia, *αμβλυσ*, obtusus, *οπτομαι*, video.

Dulness of vision, (amaurosis.)

Anchilops, *αγχι*, prope, *ωψ*, oculus.

Distension of the lachrymal sac.

Anchyloblepharon, *αγχι*, prope, *βλεφαρον*, palpebra.

Adhesion or union of the palpebræ or eyelids.

Aquo-capsulitis, inflammation of the aqueous membrane.

Atresia iridis, *ατρεμεω*, immotus maneo.

A contracted and fixed state of pupil, with the iris adherent to the anterior capsule of the lens.

Atrophy, *ατροφω*, tabesco.

Shrinking or wasting of the eyeball or globe.

Blenorrhœa, *βλεννα*, mucus, *ῥεω*, fluo.

A discharge of thick mucus from the eye.

Blepharophthalmitis, *βλεφαρον*, palpebra, *οφθαλμος*, oculus.

Inflammation of the eyelids.

Blepharo-spasmus, *βλεφαρον*, palpebra, *σπασμος*, spasmus.

Spasm of the eyelids.

Ceratocele, *κερας*, cornu, (cornea) *κηλη*, tumor.

Hernia of the cornea.

Chalasis, *χαλαζω*, demitto.

Separation of the iris from the ciliary ligament.

Chalazion—small hard tumor on the margin of the eyelid.

Chemosis, *χαινω*, hisco.

Elevation of the conjunctiva around the margin of the cornea, from subjacent effusion.

Choroiditis, *χωριον*, membrana fœti, *ειδος*, forma.

Inflammation of the choroid tunic.

Choroido-iritis.

Inflammation of the choroid and iris.

Chrupsia, *χροα*, color.

Colored vision.

Crystallinitis.

Inflammation of the lens.

Coloboma, *κολοβω*, mutilo.

Fissure, or division of the superior eyelid.

Conjunctivitis.

Inflammation of the conjunctiva.

Conjunctivo-sclerotitis.

Inflammation of the conjunctiva and sclerotic.

Corectomia, *κορη*, pupilla oculi, *εκτομη*, excisio.

Excision of the iris to form artificial pupil.

Coremorphosis, *κορη*, pupilla oculi, *μορφω*, formo.

Formation of artificial pupil.

Coretodialysis, *κορη*, pupilla oculi, *διαλυσις*, decisio.

Separation of the iris to form artificial pupil.

Corneitis.

Inflammation of the cornea.

Corotomia, *κορη*, pupilla oculi, *τεμνω*, scindo.

Incision of the iris to form artificial pupil.

Dacryocistitis, *δακρυ*, lacryma, *κυστις*, vesica.

Inflammation of the lachrymal sac.

Distichiasis, *δις*, bis, *στοιχος*, ordo.

Double row of cilia.

Ecchymosis, *εκκομιζω*, effero.

Extravasation of blood.

Ectropion, *εξ*, ex, *τρεπω*, verto.

Eversion of the eyelid.

Emphysema, *εμφυσω*, afflo.

Extravasation of air.

Empyema oculi, *εμποιω*, infero.

Effusion of pus in the chambers of the eye.

Encanthis, *εν*, in, *κανθος*, angulus oculi.

Enlargement of the caruncle.

Entropion, *εν*, in, *τρεπω*, verto.

Inversion of the eyelid.

Epicanthus, *επι*, supra, *κανθος*, angulus oculi.

Enlargement of the caruncle.

Epiphora, *επι*, supra, *φορω*, fero.

Overflowing of the tears, or conjunctival secretions.

Exophthalmia, *εξ*, ex, *οφθαλμος*, oculus.

Protrusion of the eyeball.

Exostosis, *εξ*, ex, *οστέον*, os.

Morbid growth of bone.

Gerontoxon, *γερων*, senex, *τοξον*, arcus.

An opaque crescentic line at the margin of the cornea in old persons.

Glaucoma, *γλαυκος*, glaucus.

A greenish opacity of the vitreous body and lens.

Grando,—hail.

A hard elevated cicatrix on the eyelid.

Gutta serena.

Amaurosis without organic ocular change.

Hemicrania, *ημισυς*, semi, *κρανιον*, cranium.

Pain affecting one side of the head only.

Hemeralopia, *ημερα*, dies, *οπτομαι*, video.

Night blindness.

Hemiopia, *ημισυς*, semi, *οπτομαι*, video.

Partial defect of vision, so that half or part of an object only, can be distinguished at a time.

Hordeolum,—hordeum, barley.

Common sty.

Hydrophthalmia, *υδωρ*, aqua, *οφθαλμος*, oculus.

Dropsy of the eyeball.

Hyperostosis, *υπερ*, super, *οστεον*, os.

Enlargement of bone.

Hypopion, *υπο*, sub, *πυον*, pus.

Abscess of the cornea, pus effused between its layers.

Hypochyma, *υπχευμα*, liquor.

Deep-seated opacity behind the pupil.

Hypocœma, *υπο*, sub, *αιμα*, sanguis.

Effusion of blood, deep-seated in the globe.

Hypophasia, *υποφασις*, subdiluculum.

Partial closure of the eyelids to moderate light.

Hæmophthalmia, *αιμα*, sanguis, *οφθαλμος*, oculus.

Effusion of blood into the anterior chamber.

Iridectomy, *ιρις*, iris, *εκτομη*, excisio.

Excision of iris to form artificial pupil.

Irido-dialysis, *ιρις*, iris, *διαλυσις*, decisio.

Separation of the iris to form artificial pupil.

Iridencliesis, *ιρις*, iris, *εγκλειω*, includo.

Altering the pupil, or enlarging it, by drawing the iris in part through a puncture in the cornea, leaving the portion of iris strangulated.

Iridotomia, *ιρις*, iris, *τεμνω*, scindo.

Excision of part of iris to form artificial pupil.

Iritis, *ιρις*, iris.

Inflammation of the iris.

Korectomia, *κερας*, cornu, (cornea,) *τεμνω*, scindo.

Division of the cornea.

Lagophthalmos, *λαγως*, lepus, *οφθαλμος*, oculus.

Paralysis of orbicularis muscle, so that the eyelids cannot be closed by muscular effort.

Leucoma, *λευκωμα*, album.

Dense opacity of the cornea.

Lippitudo, a watery running from the eye.

Luscitas,—luscus, blind of one eye.

Macula, a spot.

Madarosis, *μαδαρωω*, calvum facio.

A falling out of the eyelashes.

Marmaryge, *μαρμαρυγη*, splendor.

Intolerance of light.

Melanosis, *μελας*, niger.

A black morbid deposit, of malignant character.

Milium, a millet seed.

A small tumor, frequent about the eyelids.

Milphosis, *μιλφαί*, defluvium pilorum palpebræ.

Falling out of the cilia.

Mucocele, *μυξα*, mucus, *κηλη*, tumor.

Dropsy of the lachrymal sac.

Muscæ,—musca, a fly.

Black or grey spots appearing in the field of vision.

Mydriasis, *μυδριασις*, oculi vitium.

Preternatural dilatation of the pupil.

Myocephalon, *μυια*, musca, *κεφαλη*, caput.

A small protrusion of the iris through an ulcer or puncture of the cornea.

Myodesopia, *μυια*, musca, *οπτομαι*, video.

Appearance of dark or grey spots.

Myopia, *μυω*, occludo, *ωψ*, oculus.

Short-sightedness.

Myosis, *μυω*, occludo.

Preternatural contraction of the pupil.

Nebula, a cloud.

Opacity of the cornea, not dense.

Neuralgia, *νευρον*, nervus.

Severe pain without indications of inflammation.

Nævus, a natural mark.

A vascular congenital tumor.

Nyctalopia, *νυξ*, nox, *οπτομαι*, video.

Day blindness.

Nystagmus, *νυσταγμος*, dormitatio.

Involuntary motion of the eyeball.

Œdema, *οιδεω*, tumeo.

Swelling from effusion of serum.

Onyx, *ονυξ*, unguis.

Collection of pus in the anterior chamber.

Ophthalmia, *οφθαλμος*, oculus.

Inflammation of the conjunctiva.

Ophthalmia neonatorum, *νεον*, novus.

Purulent ophthalmia of infants.

Osteo sarcoma, *οστειον*, os, *σαρξ*, caro.

Morbid growth, part bony, part soft structure.

Ostitis, *οστεον*, os.

Inflammation of bone.

Oxyopia, *ωχυς*, velox.

Far-sightedness.

Pannus, coarse.

A thickened and vascular condition of the corneal conjunctiva.

Periostitis, *περι*, circum, *οστεον*, os.

Inflammation of the periosteum.

Phlyctenula, *φλυκταινα*, pustula ex fervore.

Pustules.

Photopsia, *φωτιζω*, illumino.

Appearance of sparks or flashes of light.

Photophobia, *φως*, lux, *φοβειω*, terreo.

Intolerance of light.

Phtheiriasis, *φθειριασις*, pedicularis morbus.

Lice on the cilia or eyelids, &c.

Phthisis oculi, *φθισις*, corruptio.

Shrinking of the globe.

Pinguicula,—pinguis, fat. Small fatty tumors of the conjunctiva.

Pladarotes, *πλαδαρος*, præhumidus.

Thickening of the palpebral conjunctiva.

Presbyopia, *πρεσβυς*, senex, *οπτομαι*, video.

Far-sightedness.

Psorophthalmia, *ψωρα*, scabies, *οφθαλμος*, oculus.

Soreness or excoriation of the eyelids.

Pterygium, *πτερυξ*, ala.

A partial thickening of the conjunctiva extending over the cornea, of conical figure.

Ptosis, *πιπτω*, cado.

A dropping or falling of the superior eyelid.

Retinitis.

Inflammation of the retina.

Scirrhus, *σκιρρυσ*, scirrhus.

A hard malignant tumor or swelling.

Sclerotitis, *σκληρυσ*, durus, (sclerotic.)

Inflammation of sclerotic.

Sclero-iritis, inflammation of sclerotic and iris.

Steatoma, *στεατομαι*, pinguesco.

A fatty tumor.

Stillicidium, a dropping.

A watery eye.

Strabismus, *στραβος*, luscus.

Squinting.

Staphyloma, *στάφυλη*, uva.

A rounded opaque projection from the cornea.

———— racemosum.

More than one rounded opaque projection from the cornea.

Sycosis, *σύκων*, ficus.

Granular projections from palpebral conjunctiva.

Symblepharon, *συν*, cum, *βλεφaron*.

Adhesion of the palpebral margins.

Synchysis, *συγχυσις*, confusio.

Dissolution of the vitreous humor.

Synechia, *συνεχω*, una teneo.

(Anterior,) adhesion of iris to the cornea.

(Posterior,) adhesion of iris to capsule of the lens.

Synizesis, *συνίζω*, sedere facio.

Contraction of pupil, and adhesion of the pupillary margin.

Tinea, a moth worm.

Inflammation and ulceration of the ciliary follicles.

Trachoma, *τραχυσ*, asper.

Granular state of palpebral conjunctiva.

Traumatic, *τραύμα*, vulnus.

Resulting from a wound.

Trichiasis, *τριξ*, crinis.

Inversion of one or more cilia.

Tylosis, *τύλος*, callus.

Induration of the palpebral margins.

Verruca, a wart.

Xeroma, *ξηρος*, viduus.

Deficiency of conjunctival secretion.

Xerophthalmia, *ξηρος*, *οφθαλμος*.

Inflammation of conjunctiva with deficient secretion.

ERRATUM.

Vol. I. p. 275, for *distinct* read *distant*.

Anatomy of the aqueous membrane -	vol. i. 299	Treatment -	vol. i. 325
Cerebral portion of the optic nerve -	ii. 228	Consequences -	327
Choroid -	6	Case 42 -	"
Conjunctiva -	i. 1	Aquo—capsulitis -	304
Cornea -	209	Arcus senilis -	280
Crystalline lens and its capsule -	ii. 337	Arthritic iritis -	399
Iris -	i. 329	Artificial pupil -	ii. 498
Lachrymal apparatus -	500	Author's plan of treating purulent ophthalmia -	i. 73
Retina -	ii. 91	granular conjunctiva -	132
Sclerotic -	i. 289	Belladonna,—useful in pre-serving vision -	ii. 380
Vitreous body -	ii. 95	Black cataract -	362
Anterior capsular cataract -	368	Blepharo,—conjunctivitis catarrhalis -	i. 43
Operation for cataract -	452	Blenorrhœa -	139
Apparatus, lachrymal -	500	Blindness, feigned -	ii. 322
Aqueous fluid,—specific gravity of -	i. 301	Blows on the eyebrow -	104
Analysis of -	301	Caligo lentis -	350
Aqueous membrane,—anatomy of -	299	Canal of Petit -	340
Morbid conditions of -	303	Cancer, soft -	161
Inflammation of—with deposit of fibrin -	304	Capsular cataract. <i>See Cataract.</i>	
Synonymy -	"	Caries of os unguis -	i. 518
Symptoms -	"	Caruncle -	500
Appearances -	"	Diseases of -	506
Causes -	306	Chronic enlargement and polypi -	"
Persons liable to -	"	Treatment -	"
Modifications -	307	Danger of removal -	507
Treatment -	"	Cataract -	ii. 350
Case 40 -	"	Definition -	"
41 -	310	Derivation -	"
Inflammation of—producing effusion of pus without ulceration -	314	Synonymes -	"
Local symptoms -	"	Division -	"
Constitutional symptoms -	"	Lenticular -	352
Appearances -	"	Symptoms -	"
Causes -	315	Variety in -	356
Persons liable to -	"	Progress -	358
Treatment -	"	Case 124 -	359
Inflammation and ulceration of -	318	Appearances -	360
Symptoms -	"	Case 125 -	"
Appearances -	"	Black cataracts -	362
Causes -	321	Soft ditto -	363
Persons liable to -	"	Fluid ditto -	364
Treatment -	"	Treatment -	365
Inflammation of—with increased secretion -	324	Capsular -	367
Symptoms -	"	Anterior -	368
Appearances -	"	Symptoms -	"
Causes -	325	Appearances -	369
Persons liable to -	"	Posterior -	370
		Entire -	"
		Treatment -	371
		Congenital -	"

Synonyme	vol. ii.	371	Connections	vol. ii.	228
Symptoms	-	-	Cerebral disturbance,—amau-	-	-
Appearances	-	372	rosis from	-	231
Division	-	-	Symptoms	-	-
Treatment	-	373	General symptoms	-	232
Case 126	-	376	Appearances	-	-
127	-	378	Causes	-	-
Use of belladonna	-	380	Treatment	-	233
Cataract,—treatment of—by	-	-	Chemosis	-	i. 53
operation	-	382	Division of	-	75
From injury	-	486	Serous	-	178
Synonyme	-	-	Choroid,—anatomy of	-	ii. 6
Symptoms	-	-	Derivation	-	-
Appearances	-	-	Situation	-	-
Causes	-	-	Extent	-	-
Treatment	-	487	Structure	-	7
Catarrhal ophthalmia	-	i. 43	Vasa vorticosa	-	-
Definition	-	-	Pigment	-	8
Synonymes	-	-	Morbid conditions of	-	13
Local symptoms	-	-	Distension of the vessels of	-	15
Constitutional symptoms	-	-	Synonyme	-	-
Appearances	-	44	Symptoms	-	-
Causes	-	-	Muscae	-	18
Persons liable to	-	45	Appearances	-	19
Modifications	-	-	Causes	-	-
Treatment	-	-	Persons liable to	-	21
Consequences	-	47	Treatment	-	-
Combinations	-	-	Varicosity of some of the	-	-
Of the chronic stage	-	-	vessels of	-	23
Strong local stimuli	-	48	Synonyme	-	-
Catarrho,—rheumatic oph-	-	-	Temporary congestion of	-	25
thalmia	-	377	Synonyme	-	-
Cat's eye amaurosis	-	ii. 188	Symptoms	-	-
Definition	-	-	Appearances	-	26
Symptoms	-	-	Causes	-	27
Appearances	-	189	Persons liable to	-	-
Case 90	-	190	Modifications	-	-
Cellular tissue of orbit—sim-	-	-	Treatment	-	28
ple inflammation of	-	202	Consequences	-	31
Symptoms	-	-	Choroid,—inflammation of	-	32
Appearances	-	-	Chronic	-	-
General symptoms	-	-	Synonyme	-	-
Causes	-	-	Symptoms	-	-
Persons liable to	-	-	Appearances	-	34
Treatment	-	203	Acute	-	37
Phlegmonous—inflamma-	-	-	Symptoms	-	-
tion of	-	205	Appearances	-	38
Symptoms	-	-	Causes	-	39
Appearances	-	-	Persons liable to	-	40
General symptoms	-	-	Modifications	-	-
Causes	-	-	Case 63	-	-
Treatment	-	206	Treatment	-	47
Case 92	-	207	Case 64	-	53
Cerebral portion of the optic	-	-	65	-	55
nerve—anatomy of	-	228	66	-	58
Situation	-	-	67	-	61

Case 68 - - -	vol. ii. 67	Adipose tumors of - - -	vol. i. 194
69 - - -	71	Chronic inflammation of—	
70 - - -	79	following purulent &	
Deficiency of pigment of	89	catarrhal ophthalmia.	
Choroiditis,—chronic - -	32	<i>See Purulent Ophthalmia.</i>	
acute - - -	37	Cuticular state of - - -	196
Chronic abscess of palpebræ	i. 432	Symptoms - - -	"
Inflammation of con-		Appearances - - -	"
junctiva - - -	118	Causes - - -	"
choroid - - -	ii. 32	Case 30 - - -	"
Chronic inflammation of the		Treatment - - -	197
lachrymal gland - -	i. 504	Excrescences of - - -	185
sac - - -	516	Synonyme - - -	"
Iritis - - -	362	Local symptoms - - -	"
Ophthalmia following pu-		Persons liable to - -	186
rulent and catarrhal		Treatment - - -	"
ophthalmia - - -	118	Consequences - - -	"
Simple ophthalmia - - -	139	Incisions or lacerations of	201
Scrofulous - - -	164	Injury of—from escharotics	202
Retinitis and glaucoma	ii. 128	Symptoms - - -	"
Suppuration of the cornea,	i. 238	If from lime - - -	203
Cicatrix - - -	260	acid - - -	"
Cilia,—pediculi in connec-		metal - - -	204
tion with - - -	498	Treatment - - -	205
Ciliaris,—tinea - - -	489	Granular - - -	121
Ciliary body and processes -	ii. 11	Conjunctiva and sclerotic,—	
Compound inflammation of		inflammation of - -	377
the superficial ocular		Conjunctivitis - - -	10
tunics - - -	i. 376	Pustulosa - - -	37
Concussion of the retina	ii. 102	Puro-mucosa vel atmos-	
Congenital amaurosis - -	311	pherica - - -	43
Cataract - - -	371	Scrofulosa - - -	150
Strabismus - - -	330	Conjunctivo-scleritis - -	377
Congestion of retina - -	112	Consistence of lens - -	ii. 338
Symptoms - - -	"	Contagious nature of puru-	
Appearances - - -	"	lent ophthalmia - -	i. 59
Causes - - -	"	Contracted state of the	
Persons liable to - -	113	puncta lachrymalia	509
Treatment - - -	"	Cornea,—anatomy of - -	209
Conical cornea - - -	i. 275	Synonyme - - -	"
Synonyme - - -	"	Situation - - -	"
Symptoms - - -	"	General characters	"
Appearances - - -	"	Structure - - -	"
Causes - - -	276	Connections - - -	"
Persons liable to - -	"	Organization - - -	210
Treatment - - -	"	Functions - - -	"
Conjunctiva,—anatomy of	1	Morbid conditions of - -	211
Appearances - - -	"	Inflammation of - - -	213
Division - - -	"	Synonyme - - -	"
Extent - - -	"	Local symptoms - -	"
Connections - - -	3	Appearances - - -	"
Structure - - -	4	Constitutional symptoms	217
Organization - - -	"	Causes - - -	"
Function - - -	5	Persons liable to - -	"
Morbid conditions of - -	6	Modifications - - -	"
Accidents and injuries to	198	Treatment - - -	"

Case 31	-	vol. i.	219	Causes	-	vol. i.	261
32	-	-	222	Case 38	-	-	"
33	-	-	226	Treatment	-	-	263
34	-	-	229	Opacity of—from deposit			
Consequences	-	-	232	of new matter	-	-	264
Combinations	-	-	"	From interstitial deposition			"
Cornea,—inflammation of—				Synonyme	-	-	"
terminating in suppura-				Symptoms	-	-	"
tion	-	-	233	Appearances	-	-	"
Synonyme	-	-	"	Causes	-	-	265
Onyx	-	-	"	Treatment	-	-	"
Hypopion	-	-	"	From superficial deposit			266
Acute suppuration of	-	-	234	Appearances	-	-	267
Symptoms	-	-	"	Treatment	-	-	"
Appearances	-	-	"	From escharotics	-	-	"
Causes	-	-	235	Cornea opaca	-	-	289
Persons liable to	-	-	"	Pellucida	-	-	209
Treatment	-	-	236	Conical	-	-	275
Chronic suppuration of			238	Injuries to	-	-	281
Symptoms	-	-	"	Treatment	-	-	282
Appearances	-	-	"	Prolapse of iris	-	-	285
Causes	-	-	"	Treatment	-	-	"
Persons liable to	-	-	239	Consequences	-	-	288
Treatment	-	-	"	Corneæ,—staphyloma	-	-	269
Consequences	-	-	"	Corneitis	-	-	213
Inflammation of,—with				Coup de soleil	-	ii.	243
vesication	-	-	241	Crystalline lens and its cap-			
Definition	-	-	"	sule,—anatomy of			337
Symptoms	-	-	"	Surfaces	-	-	"
Appearances	-	-	"	Situation	-	-	"
Persons liable to	-	-	242	Bulk	-	-	"
Treatment	-	-	"	Consistence	-	-	338
Case 35	-	-	"	Liquor Morgagni	-	-	"
36	-	-	243	Structure	-	-	"
37	-	-	244	Chemical analysis	-	-	339
Inflammation of—with de-				Refractive power	-	-	"
posit of earthy matter			246	Canal of Petit	-	-	340
Appearances	-	-	"	Function	-	-	341
Produced by metallic				Aberration of sphericity			"
preparations?	-	-	247	Crystalline lens and its capsule			
Causes	-	-	249	—morbid conditions of			342
Persons liable to	-	-	"	Case 123	-	-	343
Treatment	-	-	"	Inflammation of	-	-	346
Ulcers of	-	-	250	Symptoms	-	-	"
Healthy	-	-	"	Appearances	-	-	347
Inflammatory	-	-	"	Persons liable to	-	-	348
Indolent	-	-	251	Cuticular state of the con-			
Treatment	-	-	"	junctiva	-	i.	196
Deceptive cases	-	-	254	Deposition of earthy matter			
Sloughing	-	-	257	in the cornea	-	-	246
Opacities of	-	-	259	New ditto	-	-	264
From healing of ulcer or				Fibrin on the aqueous			
wound	-	-	260	membrane	-	-	304
Synonymes	-	-	"	Depression of cataract—ope-			
Symptoms	-	-	"	ration for	-	ii.	441
Appearances	-	-	"				

Difficulties of operation for cataract - - - - -	vol. ii. 407	Entropium - - - - -	vol. i. 438
Dilated puncta - - - - -	i. 510	Definition - - - - -	"
Diminished pupil—enlarge- ment or extension of - - -	ii. 503	Derivation - - - - -	"
Diseases affecting the fifth cerebral nerve - - - - -	306	Local symptoms - - - - -	"
Of the caruncle - - - - -	i. 506	Appearances - - - - -	"
lachrymal gland - - - - -	503	Causes - - - - -	439
orbit - - - - -	ii. 201	Lax integument, &c. - - -	"
puncta lachrymalia - - -	i. 508	Persons liable to - - - -	442
vitreous body - - - - -	ii. 319	Treatment - - - - -	"
palpebræ - - - - -	i. 429	Removal of integument - -	"
Displacement of the puncta -	511	Application of acid - - -	443
Distension of the vessels of the choroid - - - - -	ii. 15	Epiphora - - - - -	508
Distichiasis - - - - -	i. 495	Escharotics,—injury to con- junctiva from - - - - -	202
Division of chemosis,—ope- ration for - - - - -	75	Eversion of the eyelid - - -	451
Drilling,—operation of - - -	ii. 464	Exanthematous ophthalmia -	177
Dropsy of the lachrymal sac -	i. 517	Definition - - - - -	"
Duct,—nasal - - - - -	501	Symptoms - - - - -	"
Operations for obstruc- tions of - - - - -	523	Appearances - - - - -	"
Lachrymal,—diseases of -	508	Constitutional symptoms -	178
Dysopia - - - - -	ii. 1	Cause - - - - -	"
Ecchymosis - - - - -	i. 198	Persons liable to - - - -	"
Appearances - - - - -	199	Treatment - - - - -	"
Treatment - - - - -	"	As for pustular disease - -	179
Palpebrarum - - - - -	435	As catarrhal disease - - -	"
Ectropium - - - - -	451	As purulent disease - - -	180
Synonyme - - - - -	"	Treatment - - - - -	"
Derivation - - - - -	"	Attended with rapid ul- ceration of cornea - - -	182
Local symptoms - - - - -	"	Case 29 - - - - -	183
Appearances - - - - -	"	Treatment - - - - -	184
Causes - - - - -	452	Excrescences of the conjunc- tiva - - - - -	185
Persons liable to - - - -	"	From chronic inflamma- tion of conjunctiva - - -	123
Treatment - - - - -	"	Extraction of cataract,—ope- ration for - - - - -	ii. 383
Operation - - - - -	453	Extravasation of blood into the cellular tissue of palpebræ - - - - -	i. 435
Plastic operation to form new lid - - - - -	456	Eye,—loss of power of adapt- ing to near and distant vision - - - - -	ii. 489
Case A - - - - -	"	Symptoms - - - - -	"
B - - - - -	458	Causes - - - - -	490
Encysted tarsal tumors - - -	475	Case 137 - - - - -	491
Tumors of palpebræ un- connected with the tarsus - - - - -	478	138 - - - - -	493
Enlargement of meibomian glands - - - - -	487	Neuralgic affection of - - -	494
Or extension of a dimi- nished pupil,—ope- ration for - - - - -	ii. 503	Symptoms - - - - -	"
Case 139 - - - - -	505	Appearances - - - - -	495
140 - - - - -	507	Causes - - - - -	"
141 - - - - -	509	Persons liable to - - - -	"
		Treatment - - - - -	"
		Feigned blindness - - - - -	322
		Remarks on - - - - -	"

Case 122 -	vol. ii. 326	Incisions of conjunctiva	vol. i. 201
Fifth cerebral nerve,—dis-		Indolent ulcers of the cornea	251
ease affecting	- 306	Inflammatory ulcers of the	
Case 118 -	- "	cornea	- "
119 -	- 308	Injuries to cornea	- 281
120 -	- 309	Injury producing iritis	- 366
Fistula lachrymalis -	- i. 517	to conjunctiva from	
Fluid, aqueous,—specific		escharotics	- 202
gravity of	- 301	Inversion of eyelid	- 438
Foramen cribrosum	- ii. 91	Iris,—anatomy of	- 329
Of Soëmmerring -	- 93	Situation	- "
Fræna -	- i. 191	Pigment	- 330
Causes	- 192	Texture	- 331
Treatment	- "	Colors	- "
Fungus hæmatoides	- ii. 161	Structure	- "
Gerontoxon	- i. 280	Organization	- 332
Glandiform tumors of the		Function	- 334
palpebræ	- 469	Membrana pupillaris	- 335
Gland, lachrymal	- 500	Morbid conditions of	- 336
Glaucoma	ii. 127, 128, 146, 350	Inflammation of	- 337
Globe,—inflammation of	- ii. 193	Synonyme	- "
Symptoms	- "	Divisions	- "
Appearances	- "	Prolapse of	- 255
Glossary	- 539	Tremulous	- 374
Gonorrhœal ophthalmia	i. 49	Iris and sclerotic,—inflam-	
Granular conjunctiva	- 121	mation of	- 399
Mr. Saunders's plan of		Iritis	- 337
treatment of	- 131	Acute	- 339
Author's ditto	- 132	Symptoms	- "
Gutta opaca	- ii. 350	Appearances	- 340
serena	- 1	Constitutional symptoms	- 344
Healthy ulcers of the cornea	i. 250	Causes	- "
Hemeralopia	- ii. 282	Persons liable to	- "
Case 113	- 283	Modifications	- 345
Hemiopia	- 231	Treatment	- "
Hernia of aqueous membrane	i. 255	Case 43	- 347
Hordeolum	- 461	44	- 349
Definition	- "	45	- 350
Derivation	- "	46	- 352
Local symptoms	- "	47	- 355
Constitutional symptoms	- "	48	- 355
Appearances	- "		
Causes	- 462	Mercury principally to	
Persons liable to	- "	be relied on	- 359
Treatment	- "	Consequences	- 360
Consequences	- 463	Combinations	- 361
Hyaloid membrane	- ii. 96	Chronic	- 362
Hyalonixis	- 455	Symptoms	- "
Hydrops oculi	- 82	Appearances	- "
Hydrophthalmia	- "	Causes	- "
Hypochyma	- 350	Treatment	- 363
Hypopion	- i. 233	Iritis from injury	- 366
Inability to close the palpebræ	464	Synonyme	- "
		Causes	- "
		Treatment	- "
		Case 49	- 368
		50	- 369

Iritis,—rheumatic -	vol. i. 399	Membrana pupillaris	vol. i. 335
traumatic -	366	Milium -	468
Issue or seton objectionable	172	Muscae,—fixed -	ii. 23
		volitantes -	15
Keratonixis -	ii. 452	Mydriasis -	1
		Myocephalon -	i. 255—260
Laceration of conjunctiva	i. 201	Nasal duct -	i. 501
Lachrymalis-fistula -	517	Nævi -	482
Lachrymal gland -	500	Appearances -	„
Diseases of -	503	Treatment -	483
Acute inflammation of	„	Application of ligature	484
Treatment -	„	Case E -	485
Chronic inflammation of,		Nebula -	264
with enlargement	504	Nyctalopia -	ii. 283
Treatment -	„	Treatment -	284
Case F -	505	Remarks -	„
Lachrymal apparatus -	500	Obliterated puncta -	i. 510
sac -	501	Ocular tunics,—inflamma-	
Affections of -	513	tion of superficial	376
Acute inflammation of	„	Onyx -	233—319
Constitutional symptoms	514	Opacity of the posterior cap-	
Causes -	„	sule of lens -	ii. 370
Persons liable to -	„	Entire ditto -	„
Treatment -	„	Treatment -	371
Chronic inflammation of	516	Operation for chemosis -	i. 75
Local symptoms -	„	Operation of drilling -	ii. 464
Appearances -	„	Cases proper for	„
Dropsy of the sac -	517	Not fit for extraction	„
Ulceration of the sac -	„	Mode of operating	465
Fistula lachrymalis -	„	Repetition of -	466
Caries of os unguis -	518	Signs of absorption	„
Treatment -	„	Case 133 -	468
Causes -	519	134 -	470
Persons liable to -	„	135 -	472
Treatment -	„	136 -	473
Use of punctum probe	520	Operation of depression -	441
Injection of sac -	521	Cases proper for	„
Lagophthalmos -	464	Previous considerations	„
Lens, crystalline -	ii. 337	Instruments required -	442
Lenticular cataract. <i>See Cataract.</i>		Position of patient	„
Lesions of the retina -	ii. 195	Pupil dilated -	„
Leucoma -	i. 260	Duty of assistant -	„
Lippitudo -	490	Application of the spe-	
Liquor Morgagni -	ii. 338	culum -	„
Loss of power of adapting		Operation -	443
the eye to near and		Immediate dangers	445
distant vision -	489	How obviated -	„
Medullary sarcoma -	161	After treatment -	„
Meibomian glands,—enlarge-		Use of glasses -	446
ment of -	i. 487	Subsequent dangers	„
Symptoms -	„	Cataract rises again -	447
Appearances -	„	Operation for extraction	383
Treatment -	„	Local circumstances -	„
Membrane, aqueous -	299	Other disease -	„
Membrana Jacobi -	ii. 92		

Iris adherent to capsule of lens - vol. ii. 384	Scissors to complete the section - vol. ii. 408
Anterior chamber small, and cataract very large „	Double-bladed knife 409
Naturally small - 385	Superior lid not pro- perly secured - „
Globe soft - „	Section too small 410
Cataract of green color „	to be extended „
Situation of globe - „	Iris adherent to capsule
Size of palpebral aperture „	of lens - 411
General circumstances „	Iris wounded, forming a
Circulation too powerful 386	second pupil - 412
feeble 388	Capsule not lacerated „
How obviated - - „	Lens dislocated - „
Evidence of rheumatism or gout - 389	Hæmorrhage from cen- tral artery - - 413
Difficult respiration „	Case 128 - - „
Considerations previous to Instruments - 391	129 - - 414
Operation - 393	130 - - 415
Position of patient operator - 394	Lens sinks in vitreous humor - - „
Inclination of light „	Fragments of lens remain „
Holding the knife - 395	Opake capsule remains 416
Fixing superior lid „	Protrusion of iris - „
Preparation to commence the section - 396	Vitreous humor in part let out - - 417
Making the section - 397	Protrusion of hyaloid membrane - 418
Completing the section „	Treatment after - - 422
Pressure on the globe withdrawn - 398	Narcotics - - 423
Common cause of loss of aqueous fluid - „	Action of muscles - „
Spasmodic action of muscles - 399	Sensations usually felt „
Extent and position of section - 400	Eyelids to be cleansed 424
Assistant to command superior lid - „	Symptoms of acute in- flammation - „
Advantage of being am- bidexter - 401	General bleeding - 425
Laceration of the capsule 402	Appearances of acute disease - - 426
Extraction of lens - „	chronic „
Application of bandage 404	Constitutional affection 427
Linen moistened inju- rious - - „	Treatment of sub-acute disease - - „
Position of patient in bed 405	Case 131 - - 428
To avoid any exertion „	132 - - 430
Hands to be secured „	Protrusion of iris from injury - - 432
Application of belladonna 406	Mode of injecting - 434
Difficulties of - 407	Inflammation of sclerotic iris - 436
Eye irritable - „	Union of cornea - 437
Escape of aqueous fluid „	Exposure of eye - „
Operation deferred 408	Selection of glasses 438
Iris liberated by irritat- ing the globe - „	Operation for solution - 448
Use of curved knife - „	Not applicable to hard cataract - - „
	Applicable to soft ditto „
	Operation, anterior - 452

Synonyme	vol. ii. 452	Persons liable to -	vol. i. 12
Instruments	"	Treatment -	"
Cases proper for	- "	Influenced by disorder of	"
Operation	- "	stomach or liver	14
Produces vomiting	- 454	Case 1 -	"
Operation,—posterior	- 455	2 -	15
Synonyme	- "	3 -	"
Instruments	- "	Treatment -	16
Cases proper for	- "	Observations on treat-	"
Upon an infant	- 456	ment -	17
For opaque capsule	- 458	Influenced by disorder of	"
Capsule not absorbed	"	skin -	18
Combined, of solution and		General symptoms	"
extraction, or of solu-		Case 4 -	19
tion and depression	477	Observations on -	20
Remarks on	- 481	Influenced by disorder of	"
For changing the natural		uterus -	"
position of the pupil	499	Case 5 -	"
Enlargement or extension		Influenced by feeble power	21
of a diminished pupil	503	Causes of -	"
Case 139 -	505	Difference of symptoms	"
140 -	507	Influenced by over deple-	"
141 -	509	tion -	22
For forming a new pupil		Local symptoms -	"
when the natural one		General symptoms	23
has been destroyed,		Treatment -	"
the lens and capsule		Severe cases -	"
remaining perfect	"	Case 6 -	24
For forming a new pupil		Remarks -	26
when the original		Case 7 -	"
opening in the iris		Peculiar condition of de-	"
has been destroyed,		bility -	28
and where the crys-		Symptoms -	"
talline lens has been		Principles of treatment	29
lost -	512	Case 8 -	"
For ectropium -	i. 453	9 -	31
entropium -	442	10 -	33
congenital cataract	ii. 374	11 -	34
pterygium -	i. 189	Remarks -	"
obstructions of the		Analogous cases in ge-	"
nasal duct -	523	neral surgery -	35
passing the punctum		Consequences -	"
probe -	527	Combinations -	36
plastic to form new		Chronic, following puru-	"
lid -	456	lent and catarrhal	"
For staphyloma corneæ -	271	ophthalmia -	118
Ophthalmia -	9	Simple chronic -	139
Varieties of -	"	Definition -	"
Simple acute -	10	Synonymes -	"
Definition -	"	Symptoms -	"
Synonymes -	"	Appearances -	140
Local symptoms -	"	Constitutional symptoms	"
Appearances -	"	Causes -	141
Constitutional symptoms	11	Persons liable to -	"
Causes direct -	"	Modifications -	"
Predisposing -	12	Treatment -	"

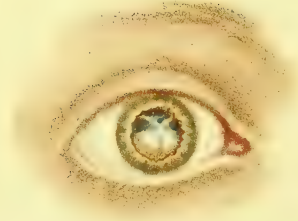
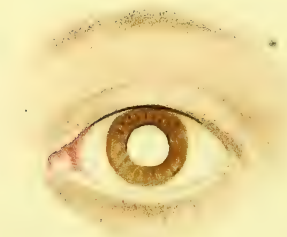
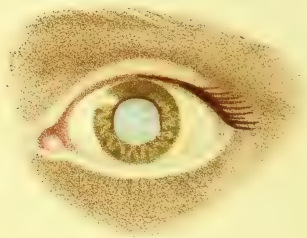
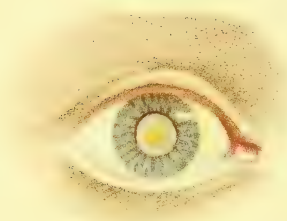
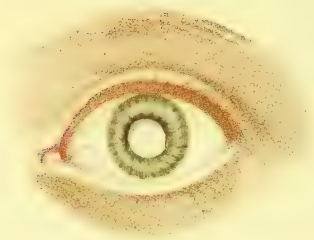
Case 24 - - -	vol. i. 144	Case 95 - - -	vol. ii. 218
25 - - -	146	96 - - -	"
Consequences - - -	149	97 - - -	222
Catarrhal - - -	43	98 - - -	"
Purulent - - -	49	Malignant tumor of - -	224
Scrofulous - - -	150	Organic amaurosis from dis-	
Chronic - - -	164	ease of brain or its	
Exanthematous - -	177	membranes - - -	235
Conjunctivitis catarrhalis	43	Os unguis,—caries of - -	i. 518
Neonatorum - - -	49	Palpebræ,—diseases of - -	429
Mucosa - - -	43	Inflammation of - - -	"
Phlyctenodes - - -	37	Local symptoms - - -	"
Pustulosa - - -	"	Constitutional symp-	
Purulenta - - -	49	toms - - -	430
Scrofulosa - - -	150	Causes - - -	"
Senilis - - -	139	Abscess over the lachry-	
Tarsi - - -	"	mal sac - - -	"
Optic nerve,—anatomy of the		Persons liable to - - -	431
cerebral portion of - ii.	228	Treatment - - -	"
Situation - - -	"	Chronic abscess of - - -	432
Connections - - -	"	Symptoms - - -	433
Shrinking of - - -	99	Cause - - -	"
Injuries to - - -	225	Persons liable to - - -	"
Case 99 - - -	226	Treatment - - -	"
Orbital portion of - -	199	Extravasation of blood into	
Extent - - -	"	the cellular tissue of - -	435
Connections - - -	"	Synonyme - - -	"
Structure - - -	"	Symptoms - - -	"
Orbit,—diseases of - -	201	Appearances - - -	"
Simple inflammation of		Causes - - -	"
cellular tissue of - -	202	Treatment - - -	"
Symptoms - - -	"	Inability to close the	464
Appearances - - -	"	Synonyme - - -	"
General symptoms - -	"	Derivation - - -	"
Causes - - -	"	Symptoms - - -	"
Persons liable to - -	"	Appearances - - -	"
Treatment - - -	203	Causes - - -	"
Phlegmonous inflamma-		Treatment - - -	465
tion of cellular tissue	205	Consequences - - -	467
Symptoms - - -	"	Tumors of - - -	468
Appearances - - -	"	Small sebaceous tumors of	"
General symptoms - -	"	Synonymes - - -	"
Causes - - -	"	Appearances - - -	"
Treatment - - -	206	Persons liable to - -	469
Case 92 - - -	207	Treatment - - -	"
Scrofulous or scrofulo-		How removed - - -	"
syphilitic disease of	209	Glandiform tumors of	"
Symptoms - - -	"	Appearances - - -	470
Appearances - - -	"	Treatment - - -	471
General symptoms - -	210	Vesicular tumors of - -	472
Causes - - -	"	Synonyme - - -	"
Treatment - - -	"	Appearances - - -	"
Tumors of - - -	211	Persons liable to - -	"
Treatment - - -	213	Treatment - - -	"
Case 93 - - -	214	Warts of - - -	474
94 - - -	215		

Synonyme -	vol. i.	474	Appearances -	vol. i.	52
Treatment -	-	"	Chemosis -	-	53
Encysted tumors of	-	478	Causes -	-	58
Appearances -	-	"	Persons liable to -	-	60
Persons liable to -	-	479	Modifications -	-	"
Treatment -	-	"	Treatment -	-	62
Mode of removing -	-	"	First stage -	-	"
Case C -	-	480	Case 12 -	-	63
D -	-	481	Second stage -	-	67
Pediculi in connection with			Case 13 -	-	69
the cilia -	-	498	Author's plan of treat-		
Synonyme -	-	"	ment -	-	73
Symptoms -	-	"	Case 14 -	-	75
Appearances -	-	"	15 -	-	79
Causes -	-	"	16 -	-	80
Persons liable to -	-	499	17 -	-	82
Treatment -	-	"	18 -	-	85
Phlyctenulæ -	153,	472	19 -	-	87
Phtheiriasis -	-	498	20 -	-	88
Plastic operation to form new			21 -	-	90
lid -	-	456	Success of author's treat-		
Polypi -	-	185	ment -	-	91
Prolapse of iris -	-	255	Third stage -	-	94
Psorophthalmia -	-	489	Remarks -	-	98
Pterygium -	-	187	Preventive plan -	-	"
Derivation -	-	"	In the infant -	-	102
Symptoms -	-	"	Local symptoms -	-	"
Appearances -	-	"	Appearances -	-	"
Membranous -	-	"	Constitutional symptoms		104
Fleshy -	-	188	Causes -	-	"
Causes -	-	"	Modifications -	-	105
Persons liable to -	-	"	Treatment -	-	"
Treatment -	-	"	Case 22 -	-	110
Ptosis -	-	ii. 241	Treatment of ectropium		115
Puncta lachrymalia -	i. 500		Consequences -	-	"
Diseases of -	-	508	Purulent and catarrhal oph-		
Derivation -	-	"	thalmia,—chronic in-		
Definition -	-	"	flammation following		118
Contracted state of -	-	509	Symptoms -	-	"
Symptoms -	-	"	Appearances -	-	120
Appearances -	-	"	Granular conjunctiva		121
Causes -	-	"	Constitutional symptoms		123
Treatment -	-	"	Causes -	-	124
Dilated -	-	510	Persons liable to -	-	125
Obliterated -	-	"	Modifications -	-	127
Displacement of -	-	511	Treatment -	-	"
Causes -	-	"	Case 23 -	-	133
Treatment -	-	512	Consequences -	-	138
Punctum probe,—mode of			Pustular ophthalmia -	-	37
passing -	-	527	Definition -	-	"
Purulent ophthalmia -	-	49	Synonymes -	-	"
Definition -	-	"	Local symptoms -	-	"
Synonymes -	-	"	Appearances -	-	"
In the adult -	-	51	Causes -	-	39
Local symptoms -	-	"	Persons liable to -	-	"
Constitutional symptoms		"	Modifications -	-	"

Treatment - - vol. i.	40	Synonyme - - vol. ii.	113
Modified by feeble power	41	Symptoms - -	114
Local symptoms of feeble power - -	"	Appearances - -	"
General symptoms - -	"	Causes - -	"
Treatment - -	42	Treatment - -	"
Consequences - -	"	Case 77 - -	115
Combinations - -	"	78 - -	116
		79 - -	120
		80 - -	122
Ramollissement ii. 242, 245,	253	Extending to vitreous body	
Retina,—anatomy of - ii.	91	and lens - -	127
Derivation - -	"	Synonymes - -	"
Extent - -	"	Divisions - -	"
Connection - -	"	Lesions of - -	195
Foramen cribrosum - -	"	Case 91 - -	"
Membrana Jacobi - -	92	Scrofulous and malignant	
Structure - -	"	disease of - -	161
Appearances - -	"	Synonymes - -	"
Foramen of Soëmmering	93	Symptoms - -	"
Organization - -	"	Appearances - -	162
Functions - -	94	Causes - -	165
Morbid conditions of - -	98	Persons liable to - -	"
Diminution or loss of vi-		Treatment - -	"
sion from affection of	99	Case 86 - -	"
Shrinking of optic nerves	"	Remarks - -	171
Symptoms - -	"	Case 87 - -	172
Appearances - -	100	88 - -	179
Causes - -	"	89 - -	182
Want of exercise - -	"	Retinitis,—chronic, and	
Excess of light - -	101	glaucoma - -	128
Case 72 - -	"	Symptoms - -	"
From lightning - -	"	Appearances - -	131
reflected light - -	102	General symptoms - -	135
Retina morbidly sensible	"	Persons liable to - -	"
Concussion - -	"	Causes predisposing - -	136
Case 73 - -	103	Case 81 - -	137
74 - -	"	82 - -	138
Blows on the eyebrow - -	104	Causes exciting - -	140
Narcotics - -	"	Treatment - -	141
Effects of belladonna - -	"	Acute, and glaucoma - -	146
Treatment - -	105	Symptoms - -	"
If from want of exercise	"	Appearances - -	147
Case 75 - -	107	General symptoms - -	149
76 - -	109	Causes - -	"
If from too brilliant light	"	Prognosis - -	150
Concussion - -	110	Persons liable to - -	151
Remote effects of		Treatment - -	"
concussion - -	111	Case 83 - -	153
If from narcotics - -	"	84 - -	154
Congestion of - -	112	85 - -	156
Symptoms - -	"	Rheumatic iritis - - i.	399
Appearances - -	"	ophthalmia - -	294
Causes - -	"		
Persons liable to - -	113	Sac,—lachrymal - -	501
Treatment - -	"	Injection of - -	521
Inflammation of - -	"	Dropsy of - -	517

Ulceration of	vol. i.	517	Scrofulous ophthalmia	vol. i.	150
Abscess over	-	430	Definition	-	"
Sarcoma,—medullary	ii.	161	Synonymes	-	"
Saunders's, Mr., treatment of			Symptoms	-	"
granular conjunctiva	i.	131	Appearances	-	151
Sclerotic,—anatomy of	-	289	Constitutional symptoms	-	154
Synonymes	-	"	Causes	-	155
Morbid conditions of	-	293	Persons liable to	-	"
Inflammation of	-	294	Modifications	-	155, 162
Synonymes	-	"	Treatment	-	156
Symptoms	-	"	Consequences	-	162
Appearances	-	"	Combinations	-	163
Causes	-	295	Chronic	-	164
Persons liable to	-	"	Symptoms	-	"
Treatment	-	"	Appearances	-	"
Case 39	-	297	Constitutional symptoms	-	166
Consequences	-	298	Causes	-	"
Combinations	-	"	Treatment	-	"
Sclerotic and conjunctiva,—			Case 26	-	170
inflammation of	-	377	Issue or seton objection-		
Definition	-	"	able	-	172
Synonymes	-	"	Case 27	-	173
Symptoms	-	"	28	-	174
Appearances	-	378	Consequences	-	175
Causes	-	380	Sebaceous tumors of the pal-		
Persons liable to	-	381	pebræ	-	468
Modifications	-	"	Serous chemosis	-	ii. 306
Treatment	-	"	Seton or issue	-	i. 172
Case 51	-	387	Soft cataract	-	ii. 363
52	-	392	Spongoid tumor	-	161
53	-	394	Staphyloma	-	i. 116
54	-	395	Corneæ	-	269
Consequences	-	398	Definition	-	"
Sclerotic and iris,—inflam-			Formation	-	"
mation of	-	399	Division	-	"
Definition	-	"	Treatment	-	270
Synonymes	-	"	Operation for removal	-	271
Symptoms	-	"	Racemosum	-	269
Appearances	-	400	Pellucidum	-	275
Constitutional symptoms	-	404	Scleroticæ	i. 293, ii. 35, 38	
Causes	-	405	Prevention of	-	ii. 538
Persons liable to	-	"	Strabismus	-	328
Treatment	-	"	Definition	-	"
Case 55	-	411	Symptoms	-	"
56	-	412	Causes	-	329
57	-	413	Congenital	-	330
Injurious effects of cold			Treatment	-	"
and moisture	-	415	From imitation or habit	-	331
Case 58	-	"	Treatment	-	"
59	-	417	From nervous influence	-	332
60	-	419	Symptoms	-	"
61	-	"	Treatment	-	333
62	-	422	Sympathetic	-	334
Consequences	-	426	Cerebral	-	"
Scleritis	-	294	Remarks	-	335
Sclero-iritis	-	399	Stye	-	i. 461

Suffusio - - - - -	vol. ii. 350	Definition - - - - -	vol. i. 493
Nigra - - - - -	1	Derivation - - - - -	"
Superficial ocular tunics,—		Symptoms - - - - -	"
compound inflamma-		Appearances - - - - -	"
tion of - - - - -	i. 376	Causes - - - - -	"
Supernumerary eyelashes -	495	Treatment - - - - -	494
Synonyme - - - - -	"	Tumors of the palpebræ -	468
Symptoms - - - - -	"	Adipose, of the conjunctiva	194
Appearances - - - - -	"	Treatment - - - - -	195
Causes - - - - -	496		
Treatment - - - - -	"	Ulceration of the lachrymal	
Suppuration,—acute, of the		sac - - - - -	517
cornea - - - - -	234	Ulcers of cornea - - - - -	250
Chronic - - - - -	238	Unguis, os,—caries of - -	518
Synechia anterior - i. 116, ii. 510		Use of punctum probe - -	520
posterior - - - - -	i. 342		
		Varicosity of some of the	
Tarsal tumors,—encysted -	475	vessels of the choroid, ii. 23	
Symptoms - - - - -	"	Vasa vorticiosa - - - - -	7
Appearances - - - - -	"	Verrucæ - - - - -	i. 474
Persons liable to - - - - -	476	Vesicular tumors of the pal-	
Treatment - - - - -	"	pebræ - - - - -	472
Temporary congestion of		Visus diffiguratus - - - -	ii. 130
choroid - - - - -	ii. 25	dimidiatus - - - - -	125
Tinea ciliaris - - - - -	i. 489	Vitreous body,—anatomy of	95
Synonymes - - - - -	"	analysis of - - - - -	96
Symptoms - - - - -	"	Derivation - - - - -	95
Appearances - - - - -	"	Hyaloid membrane - - - -	96
Causes - - - - -	491	Specific gravity - - - - -	"
Persons liable to - - - - -	"	Refractive power - - - - -	"
Treatment - - - - -	"	Organization - - - - -	"
Traumatic iritis - - - - -	366		
Cataract - - - - -	ii. 486	Warts of the palpebræ - -	i. 474
Tremulous iris - - - - -	i. 374	Synonyme - - - - -	"
Definition - - - - -	"	Treatment - - - - -	"
Trichiasis - - - - -	493		





DESCRIPTION OF PLATES, VOL. II.

PLATE IV.

- Fig. 1.* Represents a fluid lenticular cataract.
Fig. 2. Represents a mottled lenticular cataract.
Fig. 3. Represents a hard lenticular cataract indicated by the amber tint.
Fig. 4. Represents a radiated soft lenticular cataract.
Fig. 5. Represents a perfect capsular cataract.
Fig. 6. Represents a capsulo-lenticular cataract: the dense opaque capsule occupies the lower part of the pupil, and presents an irregular but defined edge above.
-

PLATE V.

- Fig. 1.* Represents the second stage of glaucoma, the pupil being enlarged, oblong, and drawn upwards; the discolor-

ration of greenish color, results from change in the vitreous humor.

Fig. 2. Represents the first stage of scrofulous or malignant disease of the retina; the brilliant yellow appearance in the pupil results from deposit in connection with the retina.

Fig. 3. Represents the second stage of malignant disease; the humors are disorganized, the globe is somewhat enlarged, and the globe and palpebræ are inflamed.

Fig. 4. Represents a section of an eye affected with malignant disease in the first stage (before the globe gives way); the morbid deposit occupies the place of the vitreous body which has been absorbed; this deposit is intimately connected with the retina, the optic nerve is much enlarged, by similar morbid action.

Fig. 5. Represents the last stage of malignant disease; the globe is greatly enlarged and projects from the palpebral aperture, but has not given way or ulcerated.

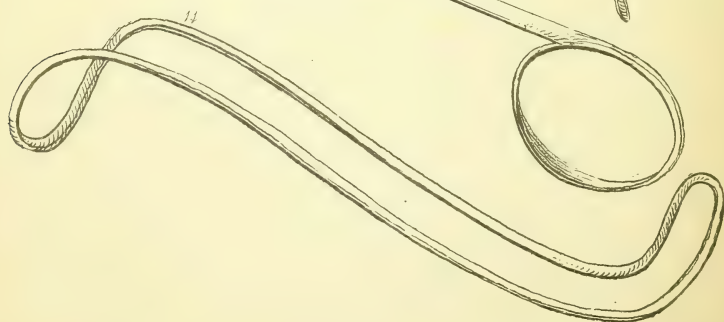
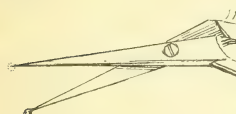
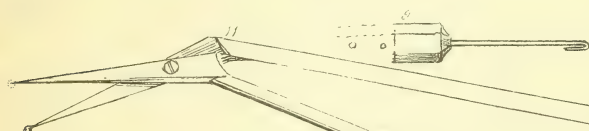
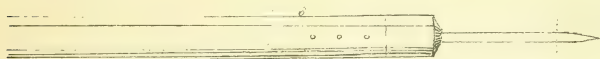
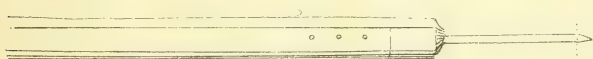
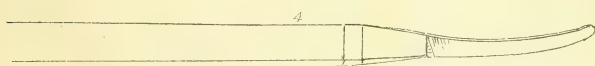
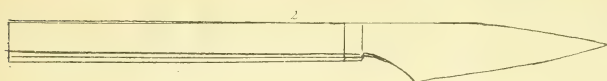
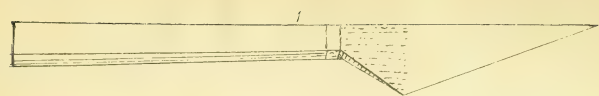
PLATE VI.

Fig. 1. Represents a partial congenital lenticular cataract, and an opake spot on the capsule.

Fig. 2. Represents one eye of a girl named Chapel, operated upon by Mr. Saunders for congenital capsulo-lenticular cataracts: some portions of detached capsule are in the anterior chamber, where they have been more than twenty years without any material change.







40

- Fig. 3.* Represents a dense central opacity of the cornea, incurable, and obscuring the pupil: the pupil should be brought outwards and downwards under the transparent part of the cornea, in such a case.
- Fig. 4.* Represents an incurable opacity occupying half of the cornea, the pupil being in great part covered, and contracted: it should be extended outwards, in such a case.
- Fig. 5.* Represents an incurable opacity, occupying four-fifths of the cornea; the pupil being entirely destroyed: a new pupil should be made with a needle and blunt hook, in such a case.
- Fig. 6.* Represents the pupil very much contracted and irregular, the margin being adherent to the anterior capsule of the lens, which is opaque, or covered by opaque matter; the state has been produced by iritis: the operation of drilling should be performed in such a case.

PLATE IX.

- Fig. 1.* Beer's knife.
 2. Wenzel's knife.
 3. Curved knife, cutting on concave edge.
 4. Curved knife, cutting on convex edge.
 5. Saunders's needle, cutting only at the point.
 6. „ „ cutting on each edge to the line.
 7. Scarpa's needle.

- Fig.* 8. Small sharp hook.
9. Blunt Iris hook. (Tyrrell's.)
10. Curette.
11. Maunoir's scissors.
12. Tube for nasal duct.
13. Style for nasal duct.
14. Wire speculum.

FINIS.



